

73

3747

Bubl. 1-21

W. G. FARLOW

Boston Mycological Club,
(Bulletin)

no. 1, 1897 to no. 21, 1904.

Cambridge Nov. 4 1908

Dear Dr. Farrow

There has been no
published list of the B.M.C.
Bulletins that I know of.

No. 10 is a Glossary of Terms
by Dr E. A. Daniells, bound in a
brown (?) cover.

No. 21 is the latest.

Yours very truly

Wm. L. G. Bates

160
BOSTON MYCOLOGICAL CLUB. [Bwe. 15]

A regular meeting will be held at Horticultural Hall, Boston, on Saturday, June 12th, at 3; Executive Committee at 2.30.

Mushrooms will be on exhibition every Saturday. Members are urged to bring in specimens for identification, and to contribute anything of interest. Consignments for exhibition should reach the Hall by 9 A. M. If sent by mail or express they may be addressed, in care of the Massachusetts Horticultural Society, to Miss E. W. Rumrill, who will be on hand to receive them and see that they are properly displayed.

Specimens for identification may be sent at any time to the Secretary at Cambridge. The following precautions should be observed:

As specimens are frequently received with the ring and other characters destroyed by handling, or with broken stem, care should be used in collecting to get the *entire plant uninjured*.

Young as well as mature specimens, and if possible spore prints should be sent. The prints may be made by laying the cap, gills downward, on paper; by placing over it a cover of some sort, to keep out draughts of air; and by leaving it thus for a few hours. If the spores are suspected to be white, black or blue paper must be used.

Perishable specimens should be sent without delay, and separately, that they may not by decay spoil others.

Each specimen should be wrapped loosely in soft paper, around which, if necessary, something stiffer may be put; and crumpled paper or some equivalent should be freely used in packing to prevent injury on the way.

Each specimen should be numbered and check specimens similarly numbered should be kept. Notes as to habitat and manner of growth should be given, for identification is often materially assisted by the knowledge at the outset that a fungus grows on or under a certain kind of tree, in a certain sort of soil, in a damp or dry place, etc.; or that it is solitary, or in clusters, or caespitose, (*i. e.* with stems having a common base).

In the case of perishable plants information about the fresh state, particularly the color of the young gills, the character of the veil, the ring, and other evanescent features should be mentioned.

A particular request is made that specimens of anything unusual be forwarded to the Secretary, for it is desired to get as complete a knowledge as possible of our native fungi. Blank forms for field notes will soon be sent to those who request them.

The following species, edible, unless otherwise noted, are among those reported.

Morchella conica, was abundant from the first week in May. Sandy soil under apple trees seemed to be the best place to look for it, according to Messrs. Bates and Whittle. It has been found within a week. Information is wanted as to whether any spot furnishes definitely more than one crop in a season.

M. esculenta is sparingly reported.

Gyromitra (*Helvella*) *esculenta* was found in Lowell.

Coprini, as usual, have been abundant. *Coprinus micaceus* (often reported as *C. congregatus*) in thick bunches has appeared on stumps

and at the foot of trees, and passed thence to the chafing dish. *C. atramentarius* and *C. comatus* have made their annual spring appearance. *C. finetarius* is recommended by Mr. Whittle, who has long eaten it. This is literally the creature of a night, and shrivels and evaporates in the early sunshine. It grows on dung heaps, in repeated crops, and is known by its thin, revolute, (in the button cylindrical) torn white-floccose cap, and shining white, hollow, fragile stem. It should be gathered soon after sunrise. Old and shrivelled specimens are still good eating.

Collybia velutipes was found in April.

Pluteus cervinus; frequent on stumps. Its *free* gills should distinguish it from any *Entoloma*, which it may be desired to avoid, though both have pink spores and therefore eventually pink gills.

Pholiota praecox, often dingy and water-soaked, has been plentiful and is still to be had. Its brown spores and ring (easily and usually rubbed off) distinguish it.

Hypholoma candolleianum has been plentiful in short grass. Its purple spores, appendiculate edge (when fresh), creamy gills turning through violet to almost black, and its fragile somewhat revolute and often torn light brownish cap distinguish it. It usually grows in troops, and will furnish repeated dishes through the season.

In the grass, also, Fairy Ring mushrooms have been plentiful. With them grows *Naucoria semi-orbicularis*, which is, therefore, sometimes gathered and eaten.

The *Naucoria* has dark gills and brown spores; the other (*Marasmius oreades*) has gills lighter than the light-brown cap, which typically is slightly umbonate (humped) on top.

Stropharia semiglobata, hardly to be distinguished from the *Naucoria* at first sight, grows nearby, often on dung. It has a ring and purple spores. It is not considered edible. Who has eaten it?

In damp places, in moss, *Lactarius subdulcis* shows its dull red cap, often with a small central point.

Clitocybe multiceps, with firm, smooth, usually whitish cap, the margin incurved in the buttons, gills decurrent, and solid stem, grows in open places in clumps. Examine this if you would know what is meant by *caespitose*.

Agaricus campestris, and *A. arvensis* have been reported.

Tricholoma rutilans, with yellow gills and flesh, the cap and stem covered with reddish purple floccose scales, has been found here and there in quantity.

Reports are requested from all members in regard to species observed or eaten, with such notes as may be valuable.

Arrangements have been made by which copies of government publications relating to fungi will be sent to members. Farmers' Bulletin, No. 53, has just been distributed. The Secretary would be glad to know if any one has failed to receive it. Bulletin, No. 54, will be sent when published.

The Secretary would be glad to hear from those who have not remitted 50 cents in payment of the Peck reprint sent them.

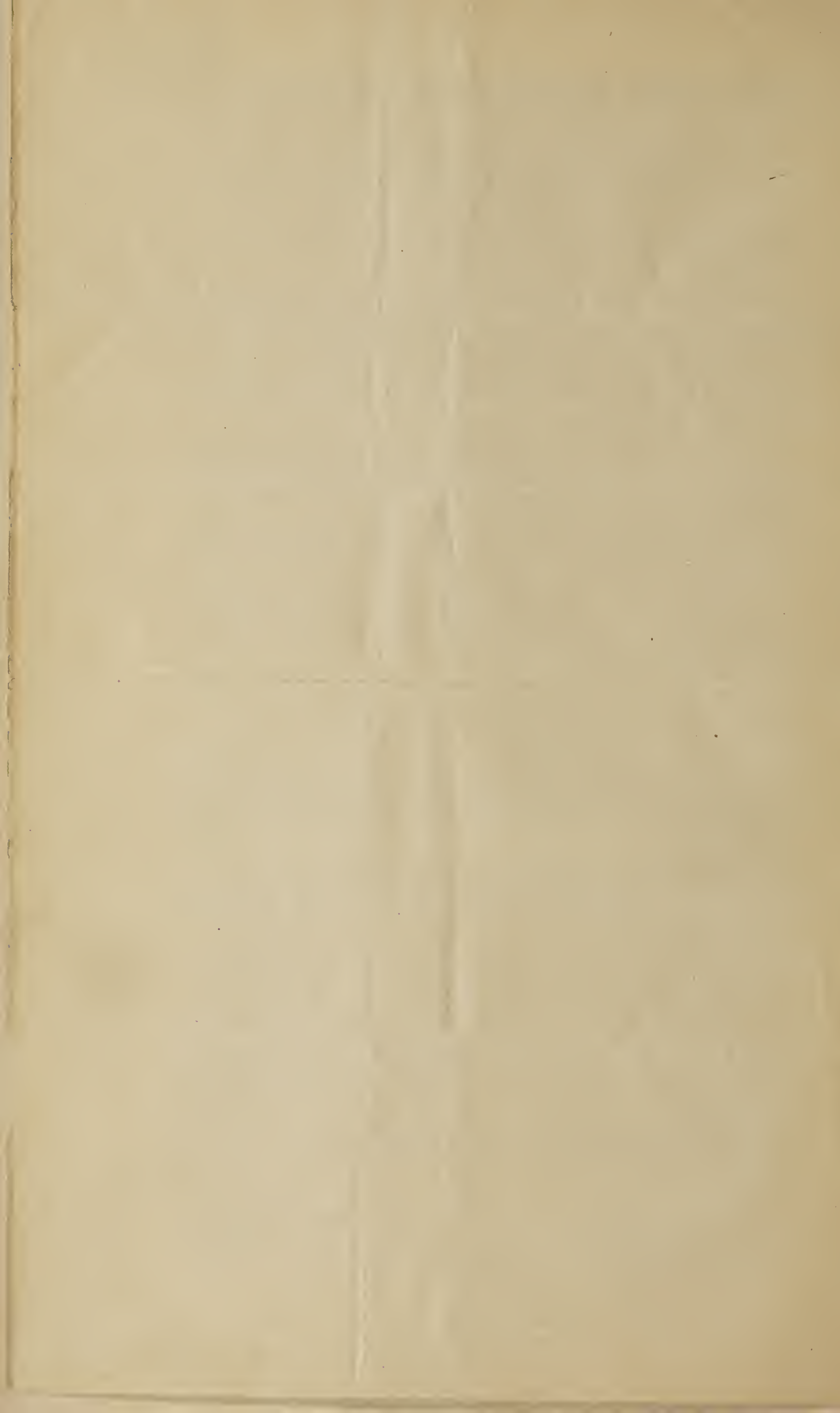
18 Claverly Hall,

Cambridge, Mass.

June 8th, 1897.

HOLLIS WEBSTER,

Secretary.



Boston Mycological Club.

Bulletin No. 2, 1897.

Excursions. Every one who intends to go will please notify the leader one day in advance, in order that accommodations, and tickets may be provided.

July 16th (Friday). East Milton. Leave N. Y., N. H. & H., (Kneeland St. Station) at 2.18 P. M. Return at 6.19, or at pleasure. Walk of 2-4 miles. No notice need be sent. 17cts.

July 22nd (Thursday). Lincoln and the Trapelo Road. Leave Union Station at 12.30 P. M. for Concord. Return about 6.00 P. M. from Waltham. Drive in barges, walking at pleasure. H. WEBSTER, Box 21, Cambridge. About \$1.25.

July 23rd (Friday). Cabot's Woods and Prospect Park. Leave Horticultural Hall by electric car at 2.00 o'clock. Short walks, return at pleasure. W. C. BATES, 131 Devonshire St., Boston. About 25 cts.

July 23rd (Friday). Lynn Woods and Dungeon Rock. Leave Union Station at 12.40 P. M. and Lynn Station by special car at 1.10. Return from Lynn at 4.53 P. M. Walk of $\frac{1}{2}$ to 2 miles. Dr. R. T. DEARBORN, 16 So. Common St., Lynn. 34 cts.

On Saturday, July 24th, Saturday, Aug. 21st, and Saturday, Sept. 11th, **Prizes for Native Mushrooms** are offered by the Massachusetts Horticultural Society as follows: 1st \$4.00; 2nd \$3.00; 3rd \$2.00. Competitors should reach the Hall by 9 A. M. Everything must be on the table at 11 A. M., when exhibits will be judged.

The Next Regular Meeting will be held on Saturday, July 24th, at 3 P. M. In connection with this there will be talks on the specimens exhibited, and also a chafing-dish demonstration.

Saturday Talks will be given as often as possible, special attention being paid as in the past to demonstration of the characteristics of common edible and poisonous species. On days when the Club has the Upper Hall to itself these talks will be held between 12 and 1, and between 2 and 3 P. M.

In answer to queries with regard to **sending perishable mushrooms** for identification it may be said that the best method is to dry the plants first. This may be done in a wire frame over a stove. A careful description and sketch of the fresh plant should accompany the dried specimens. (See Underwood's "Suggestions," noticed on another page).

The blank forms ("**Collector's Notes**") are at last ready for distribution, at one cent each, to cover cost. Those who wish to use them are advised to read some descriptions in Stevenson, Peck, or some other authority in order to learn what are the essential things to note. They should also consult some glossary of terms, such as that in Stevenson, vol. ii, or in Taylor's "Handbook", now being published.

The following directions for **Fixing Spore Prints** are taken from Herpel ("**Das Präpariren der Hutpilze**").

Paper which is somewhat absorbent must be used, — unglazed blue or black paper (of which the color must be unaffected by the fixative) for white spored species. The piece of paper bearing the spore print is to be laid, spores upward, in a flat plate or platter, on which a thin layer of fixative has first been poured. The fixative is allowed to soak up through from below, and should not overflow the edges of the paper. When it is certain that the spores as well as the paper are thoroughly soaked, the preparation is removed and dried, sometimes, to prevent sticking, being laid on moistened blotting paper.

The fixative to be used will vary with the species. For instance the spores of *Cantharellus cibarius* and some others may be fixed by water

alone. The following solution is recommended for Boleti and species with colored spores: 1 part sandarac, 2 parts mastic, and 2 parts Canada balsam dissolved in 30 parts of 95% alcohol. In the use of this it has been found that the time of soaking necessary to fix the spores is for Boleti, 2 minutes; Dermis, Coprinarii, Gomphidius, Paxillus, Russula and Lactarius, 4 to 5 minutes; pink spored agarics, also dark brown spored (as the meadow mushroom), and Cortinari, 6 to 8 minutes. It is important that the alcohol should be full strength.

A gelatin solution is useful for white spored species. This is prepared and used warm. Its strength varies with the species. *Lepiota procera*, *Collybia radicata*, and *Clitocybe laccata* may be fixed by a solution of 1 part gelatin to 30 of water. For species of *Tricholoma* this is too strong, and 1 to 60, or 1 to 200 must be the formula. The difficulty arises here from the fact that an excess of gelatin makes the spores transparent and even invisible. Their opacity may be secured by previous treatment with a solution of 1 part mastic in 30 of ether.

For certain kinds (*Tricholoma personatum*, *Lepiota granulosa*, *Amanitopsis vaginata*, and others which experiment will discover), 10 to 25 per cent. of alcohol must be added to the gelatin solution in order to make the spores adhere.

Experience will doubtless show that other fixatives may be used. Gum arabic, for instance, suggests itself. This, however, if strong, is apt to cake the spores together. If one method fails, invention and repeated trials must find a successful means. Reports are requested from all who engage in the amusement of making spore prints. To these a suggestion not without value is that dry agarics (like *Marasmius* and some *Collybias*) may be kept in a condition to shed spores by putting moistened blotting paper under them.

A word as to **Color Nomenclature** may be of use, especially since widespread objection is made to the conventional designation "purple" applied by some writers to the dark brown spores of *Agaricus*, *Hypholoma*, and other genera. In order that some system (even if not the ideally best) may be adopted in our descriptions, it is suggested that use be made of the color charts in Saccardo's "Chromotaxia," mentioned elsewhere. This would give uniformity, and the chart could be used as a key in interpreting written descriptions of specimens sent in for identification. It can and will no doubt be supplemented by the varied and exact color vocabulary drawn from familiar objects, such as blood, lemons, and mice.

The following **Useful Books** are noted here for the benefit of those who may not know them.

Notes for Mushroom Eaters, W. G. Farlow, (25 cts.), contains the soundest advice to the inexperienced, together with a general account of the principal groups of fungi, with special descriptions and cuts of some of the common edible and poisonous kinds.

Suggestions to Collectors of Fleishy Fungi, L. M. Underwood (25 cts.), contains a synopsis of essential characters to be noted, a key to genera, and brief notes of the extent and edible characters, with references to the most complete synopses of some American genera.

Mushrooms and Their Use, C. H. Peck (50 cts.), contains the fullest general and popular account with cuts of our common native species, and is as useful a book as a beginner can get hold of.

Führer für Pilzfreunde, E. Michael (\$1.75), contains much useful information as to collection for the table, cooking, etc.; also fine naturally drawn and colored plates of 68 species (all but a few are common with us) with brief descriptions of each. It is useful even to those ignorant of German.

British Edible Fungi, M. C. Cooke, (\$2.50) contains descriptions and colored plates of upwards of 40 species, with other entertaining matter.

Appended is a list of about 200 edible species.

Clavis Agaricinorum, W. G. Smith, (75cts.) contains descriptions of families and genera (in English) with some account of their fitness for food. Appended are charts of outline drawings to show the structure and systematic relation of the genera (according to Fries) of the Agarics proper. There is also a key to genera and a list of British Agarics (complete to 1870.)

Chromotaxia, P. A. Saccardo, (50 cts.) contains charts of fifty standard reference colors, with names and synonyms in five languages.

The Boleti of the U. S., C. H. Peck, (40cts. ?) contains a synopsis with detailed descriptions of our species. Published as Bulletin No. 8 of N. Y. State Museum, and now increasing in price.

To these may be added Stevenson's British Hymenomycetes, 2 vols., (\$8.06); Massee's British Fungus Flora, 4 vols., separately at \$2.00 each; Phillips's British Discomycetes (plates, \$1.50); all systematic works serving in large part for our own flora.

Prices quoted are those of the Cambridge Botanical Supply Co., who may be addressed at Cambridge, Mass.

Attention is called to the following extract from a letter of Dr. W. G. Farlow in acknowledgment of his election to honorary membership:

"It may be of interest to the members of the Club to know that, thanks to the liberality of friends, it is now possible to carry out a plan which has long been desired but was not practical in the absence of money to pay for necessary cases, viz.: to arrange an exhibition of cryptogams, especially of useful and injurious fungi, on the first floor of the Botanical Museum at Cambridge. It is expected that the cases will be ready during the summer, and it is hoped that before the end of the season a good beginning of an instructive collection will be made, which can be completed a year hence.

I should be greatly obliged to those who feel inclined to aid in making the collection useful to the public for typical specimens of fungi, and of distortions and injuries of trees, due to vegetable parasites or to wounds caused by man or other animals."

The Secretary will be glad to see that anything sent to him reaches the proper destination. Bulky or heavy specimens had best not be sent without a previous inquiry for directions.

For the future it is requested that **Remittances** to the Secretary and Treasurer be by **Check, Money Order, or Registered Letter**. One letter containing money has been lost.

Change of address, temporary or permanent, should be reported at once.

The season for the July Boleti is at hand. The following species are among those most likely to be found: *Boletinus pictus* Pk. Known by the red fibrillose scales of the cap, which lie on a yellowish background, and by the webby veil. The yellow flesh slowly turns pinkish.

Boletus subluteus Pk. Known by its viscid dingy yellow cap, and stem dotted both above and below the *ring*. (!)

Boletus Americanus Pk. It has a thin, very viscid or glutinous, yellow, or dingy pileus, dotted or streaked with red; rather large angular tubes; slender, yellow, brown-dotted stem. Common.

Boletus granulatus L. It has a very viscid brownish or yellowish cap; pale yellow flesh; and glandular-dotted tubes and stem. (!)

Boletus badius Fr. Pileus tawny chestnut; white and yellow flesh, bluish near tubes, which are large; stem solid, brown pruinose. In pine woods. (!)

Boletus bovinus L. Viscid, pale yellow; flesh white; tubes very short, subdecurrent, mouths compound, grayish yellow to ferruginous. Pine woods. (!)

Boletus piperatus Bull. Peppery in taste.

Boletus miniato-olivaceus Frost. Pileus spongy, vermilion to olivaceous; pale yellow flesh, changing to blue; tubes bright yellow, adnate or subdecurrent; stem enlarged at the top, pale yellow, brighter within, sometimes lurid at the base. Peck describes a common variety with the pileus red, at first tomentose; stem, when young, contracted at the top; tubes tinged with green. Any part of the plant changes to blue when touched. This species is said to have caused severe illness. It is often confounded with the next two.

Boletus chrysenteron Fr. Pileus soft, floccose, often areolate, the cracks showing the reddish tint of the flesh under the skin; the greenish yellow subadnate tubes change to blue, and have large angular unequal mouths; stem red or pale yellow. A variable species, brick red, brown red, or olivaceous.

Boletus subtomentosus L. Pileus soft, dry, tomentose, reddish brown or subolivaceous, often areolate, the cracks showing yellowish; tubes adnate or depressed, yellow, mouths large and angular; stem sometimes ribbed or furrowed, scurfy with minute dots. The tubes do not change color on being wounded.

Boletus Russelli Frost. Known by its scaly reddish pileus, long red lacerated stem, and unchanging yellowish flesh.

Boletus ornatipes Pk. Known by its grayish or yellowish brown pileus, yellow tubes and flesh, and beautifully reticulated, yellow, often rather slender stem.

Boletus edulis Bull. (Accent the second syllable.) Known by its smooth, brownish, or reddish cap, which shows a red tint under the skin; convex tubes, which are nearly free, long, minute, white, then yellow or greenish with age; stem very variable, but often swollen to huge dimensions; taste peculiarly agreeable, slightly yeasty when stale. The reticulations on the stem are not always prominent. (!)

Boletus alveolatus B & C. Pileus shining crimson, often yellowish; flesh white, changing to blue; tubes with reddish mouths, pitted with depressions; stem with coarse red reticulations.

Boletus luridus Schaeff. Pileus brownish; flesh yellow, changing to blue; tubes free, yellow then greenish, their mouths vermilion, becoming orange.

Boletus scaber Fr. Very variable, but known by its scabrous black-dotted stem and free tubes. *B. versipellis*, closely related, has a pale reddish cap, to the edge of which adhere fragments of the veil. (!)

Boletus chromapes Frost. Known by its tapering stem, with base chrome yellow without and within.

Boletus felleus Bull. Known by its white tubes, which become tinged with flesh color, and its bitter taste.

Boletus castaneus Bull. Pileus velvety, cinnamon or reddish brown; flesh white, not changing; tubes free, short, white or yellowish; stem colored like the pileus. (!)

Strobilomyces strobilaceus Berk. Pileus convex, covered with large prominent blackish scales; tubes not easily separated from the cap; flesh changing to reddish and then to blackish. Entirely distinct in appearance. The young specimens show a floccose veil. (!)

The Boleti here noted are among the 110 species described by Peck. More complete descriptions may be found in his synopsis. Of those mentioned *B. miniato-olivaceus*, *B. alveolatus* and *B. luridus* are regarded with suspicion. In using boleti for food it should be remembered that they should be picked when young and firm, and used at once, for they are exceedingly liable to decay. Yet the firmer sorts may be readily dried and kept for winter use. Those marked (!) are known to be excellent eating.

HOLLIS WEBSTER, *Secretary*.

Cambridge, July 13, 1897.

Boston Mycological Club.

Bulletin No. 2, 1897.

Excursions. Every one who intends to go will please notify the leader one day in advance, in order that accommodations, and tickets may be provided.

July 16th (Friday). East Milton. Leave N. Y., N. H. & H., (Kneeland St. Station) at 2.18 P. M. Return at 6.19, or at pleasure. Walk of 2-4 miles. No notice need be sent. 17cts.

July 22nd (Thursday). Lincoln and the Trapelo Road. Leave Union Station at 12.30 P. M. for Concord. Return about 6.00 P. M. from Waltham. Drive in barges, walking at pleasure. H. WEBSTER, Box 21, Cambridge. About \$1.25.

July 23rd (Friday). Cabot's Woods and Prospect Park. Leave Horticultural Hall by electric car at 2.00 o'clock. Short walks, return at pleasure. W. C. BATES, 131 Devonshire St., Boston. About 25 cts.

July 23rd (Friday). Lynn Woods and Dungeon Rock. Leave Union Station at 12.40 P. M. and Lynn Station by special car at 1.10. Return from Lynn at 4.53 P. M. Walk of $\frac{1}{2}$ to 2 miles. Dr. R. T. DEARBORN, 16 So. Common St., Lynn. 34 cts.

On Saturday, July 24th, Saturday, Aug. 21st, and Saturday, Sept. 11th, **Prizes for Native Mushrooms** are offered by the Massachusetts Horticultural Society as follows: 1st \$4.00; 2nd \$3.00; 3rd \$2.00. Competitors should reach the Hall by 9 A. M. Everything must be on the table at 11 A. M., when exhibits will be judged.

The Next Regular Meeting will be held on Saturday, July 24th, at 3 P. M. In connection with this there will be talks on the specimens exhibited, and also a chafing-dish demonstration.

Saturday Talks will be given as often as possible, special attention being paid as in the past to demonstration of the characteristics of common edible and poisonous species. On days when the Club has the Upper Hall to itself these talks will be held between 12 and 1, and between 2 and 3 P. M.

In answer to queries with regard to **sending perishable mushrooms** for identification it may be said that the best method is to dry the plants first. This may be done in a wire frame over a stove. A careful description and sketch of the fresh plant should accompany the dried specimens. (See Underwood's "Suggestions," noticed on another page).

The blank forms ("**Collector's Notes**") are at last ready for distribution, at one cent each, to cover cost. Those who wish to use them are advised to read some descriptions in Stevenson, Peck, or some other authority in order to learn what are the essential things to note. They should also consult some glossary of terms, such as that in Stevenson, vol. ii, or in Taylor's "Handbook", now being published.

The following directions for **Fixing Spore Prints** are taken from Herpel ("**Das Präpariren der Hutzpilze**").

Paper which is somewhat absorbent must be used, — unglazed blue or black paper (of which the color must be unaffected by the fixative) for white spored species. The piece of paper bearing the spore print is to be laid, spores upward, in a flat plate or platter, on which a thin layer of fixative has first been poured. The fixative is allowed to soak up through from below, and should not overflow the edges of the paper. When it is certain that the spores as well as the paper are thoroughly soaked, the preparation is removed and dried, sometimes, to prevent sticking, being laid on moistened blotting paper.

The fixative to be used will vary with the species. For instance the spores of *Cantharellus cibarius* and some others may be fixed by water

alone. The following solution is recommended for Boleti and species with colored spores: 1 part sandarac, 2 parts mastic, and 2 parts Canada balsam dissolved in 30 parts of 95% alcohol. In the use of this it has been found that the time of soaking necessary to fix the spores is for Boleti, 2 minutes; Dermis, Coprinarii, Gomphidius, Paxillus, Russula and Lactarius, 4 to 5 minutes; pink spored agarics, also dark brown spored (as the meadow mushroom), and Cortinari, 6 to 8 minutes. It is important that the alcohol should be full strength.

A gelatin solution is useful for white spored species. This is prepared and used warm. Its strength varies with the species. *Lepiota procera*, *Collybia radicata*, and *Clitocybe laccata* may be fixed by a solution of 1 part gelatin to 30 of water. For species of *Tricholoma* this is too strong, and 1 to 60, or 1 to 200 must be the formula. The difficulty arises here from the fact that an excess of gelatin makes the spores transparent and even invisible. Their opacity may be secured by previous treatment with a solution of 1 part mastic in 30 of ether.

For certain kinds (*Tricholoma personatum*, *Lepiota granulosa*, *Amanitopsis vaginata*, and others which experiment will discover), 10 to 25 per cent. of alcohol must be added to the gelatin solution in order to make the spores adhere.

Experience will doubtless show that other fixatives may be used. Gum arabic, for instance, suggests itself. This, however, if strong, is apt to cake the spores together. If one method fails, invention and repeated trials must find a successful means. Reports are requested from all who engage in the amusement of making spore prints. To these a suggestion not without value is that dry agarics (like *Marasmius* and some *Collybias*) may be kept in a condition to shed spores by putting moistened blotting paper under them.

A word as to **Color Nomenclature** may be of use, especially since widespread objection is made to the conventional designation "purple" applied by some writers to the dark brown spores of *Agaricus*, *Hypophoma*, and other genera. In order that some system (even if not the ideally best) may be adopted in our descriptions, it is suggested that use be made of the color charts in Saccardo's "Chromotaxia," mentioned elsewhere. This would give uniformity, and the chart could be used as a key in interpreting written descriptions of specimens sent in for identification. It can and will no doubt be supplemented by the varied and exact color vocabulary drawn from familiar objects, such as blood, lemons, and mice.

The following **Useful Books** are noted here for the benefit of those who may not know them.

Notes for Mushroom Eaters, W. G. Farlow, (25 cts.), contains the soundest advice to the inexperienced, together with a general account of the principal groups of fungi, with special descriptions and cuts of some of the common edible and poisonous kinds.

Suggestions to Collectors of Fleshy Fungi, L. M. Underwood (25 cts.), contains a synopsis of essential characters to be noted, a key to genera, and brief notes of the extent and edible characters, with references to the most complete synopses of some American genera.

Mushrooms and Their Use, C. H. Peck (50 cts.), contains the fullest general and popular account with cuts of our common native species, and is as useful a book as a beginner can get hold of.

Führer für Pilzfreunde, E. Michael (\$1.75), contains much useful information as to collection for the table, cooking, etc.; also fine naturally drawn and colored plates of 68 species (all but a few are common with us) with brief descriptions of each. It is useful even to those ignorant of German.

British Edible Fungi, M. C. Cooke, (\$2.50) contains descriptions and colored plates of upwards of 40 species, with other entertaining matter.

Appended is a list of about 200 edible species.

Clavis Agaricinorum, W. G. Smith, (75cts.) contains descriptions of families and genera (in English) with some account of their fitness for food. Appended are charts of outline drawings to show the structure and systematic relation of the genera (according to Fries) of the Agarics proper. There is also a key to genera and a list of British Agarics (complete to 1870.)

Chromotaxia, P. A. Saccardo, (50 cts.) contains charts of fifty standard reference colors, with names and synonyms in five languages.

The Boleti of the U. S., C. H. Peck, (40cts. ?) contains a synopsis with detailed descriptions of our species. Published as Bulletin No. 8 of N. Y. State Museum, and now increasing in price.

To these may be added Stevenson's British Hymenomycetes, 2 vols., (\$8.06); Massee's British Fungus Flora, 4 vols., separately at \$2.00 each; Phillips's British Discomycetes (plates, \$1.50); all systematic works serving in large part for our own flora.

Prices quoted are those of the Cambridge Botanical Supply Co., who may be addressed at Cambridge, Mass.

Attention is called to the following extract from a letter of Dr. W. G. Farlow in acknowledgment of his election to honorary membership:

"It may be of interest to the members of the Club to know that, thanks to the liberality of friends, it is now possible to carry out a plan which has long been desired but was not practical in the absence of money to pay for necessary cases, viz.: to arrange an exhibition of cryptogams, especially of useful and injurious fungi, on the first floor of the Botanical Museum at Cambridge. It is expected that the cases will be ready during the summer, and it is hoped that before the end of the season a good beginning of an instructive collection will be made, which can be completed a year hence.

I should be greatly obliged to those who feel inclined to aid in making the collection useful to the public for typical specimens of fungi, and of distortions and injuries of trees, due to vegetable parasites or to wounds caused by man or other animals."

The Secretary will be glad to see that anything sent to him reaches the proper destination. Bulky or heavy specimens had best not be sent without a previous inquiry for directions.

For the future it is requested that **Remittances** to the Secretary and Treasurer be by **Check, Money Order, or Registered Letter**. One letter containing money has been lost.

Change of address, temporary or permanent, should be reported at once.

The season for the July Boleti is at hand. The following species are among those most likely to be found: *Boletinus pictus* Pk. Known by the red fibrillose scales of the cap, which lie on a yellowish background, and by the webby veil. The yellow flesh slowly turns pinkish.

Boletus subluteus Pk. Known by its viscid dingy yellow cap, and stem dotted both above and below the *ring*. (!)

Boletus Americanus Pk. It has a thin, very viscid or glutinous, yellow, or dingy pileus, dotted or streaked with red; rather large angular tubes; slender, yellow, brown-dotted stem. Common.

Boletus granulatus L. It has a very viscid brownish or yellowish cap; pale yellow flesh; and glandular-dotted tubes and stem. (!)

Boletus badius Fr. Pileus tawny chestnut; white and yellow flesh, bluish near tubes, which are large; stem solid, brown pruinose. In pine woods. (!)

Boletus bovinus L. Viscid, pale yellow; flesh white; tubes very short, subdecurrent, mouths compound, grayish yellow to ferruginous. Pine woods. (!)

Boletus piperatus Bull. Peppery in taste.

Boletus miniato-olivaceus Frost. Pileus spongy, vermilion to olivaceous; pale yellow flesh, changing to blue; tubes bright yellow, adnate or subdecurrent; stem enlarged at the top, pale yellow, brighter within, sometimes lurid at the base. Peck describes a common variety with the pileus red, at first tomentose; stem, when young, contracted at the top; tubes tinged with green. Any part of the plant changes to blue when touched. This species is said to have caused severe illness. It is often confounded with the next two.

Boletus chrysenteron Fr. Pileus soft, floccose, often areolate, the cracks showing the reddish tint of the flesh under the skin; the greenish yellow subadnate tubes change to blue, and have large angular unequal mouths; stem red or pale yellow. A variable species, brick red, brown red, or olivaceous.

Boletus subtomentosus L. Pileus soft, dry, tomentose, reddish brown or subolivaceous, often areolate, the cracks showing yellowish; tubes adnate or depressed, yellow, mouths large and angular; stem sometimes ribbed or furrowed, scurfy with minute dots. The tubes do not change color on being wounded.

Boletus Russelli Frost. Known by its scaly reddish pileus, long red lacerated stem, and unchanging yellowish flesh.

Boletus ornatipes Pk. Known by its grayish or yellowish brown pileus, yellow tubes and flesh, and beautifully reticulated, yellow, often rather slender stem.

Boletus edulis Bull. (Accent the second syllable.) Known by its smooth, brownish, or reddish cap, which shows a red tint under the skin; convex tubes, which are nearly free, long, minute, white, then yellow or greenish with age; stem very variable, but often swollen to huge dimensions; taste peculiarly agreeable, slightly yeasty when stale. The reticulations on the stem are not always prominent. (!)

Boletus alveolatus B & C. Pileus shining crimson, often yellowish; flesh white, changing to blue; tubes with reddish mouths, pitted with depressions; stem with coarse red reticulations.

Boletus luridus Schaeff. Pileus brownish; flesh yellow, changing to blue; tubes free, yellow then greenish, their mouths vermilion, becoming orange.

Boletus scaber Fr. Very variable, but known by its scabrous black-dotted stem and free tubes. *B. versipellis*, closely related, has a pale reddish cap, to the edge of which adhere fragments of the veil. (!)

Boletus chromapes Frost. Known by its tapering stem, with base chrome yellow without and within.

Boletus felleus Bull. Known by its white tubes, which become tinged with flesh color, and its bitter taste.

Boletus castaneus Bull. Pileus velvety, cinnamon or reddish brown; flesh white, not changing; tubes free, short, white or yellowish; stem colored like the pileus. (!)

Strobilomyces strobilaceus Berk. Pileus convex, covered with large prominent blackish scales; tubes not easily separated from the cap; flesh changing to reddish and then to blackish. Entirely distinct in appearance. The young specimens show a floccose veil. (!)

The Boleti here noted are among the 110 species described by Peck. More complete descriptions may be found in his synopsis. Of those mentioned *B. miniato-olivaceus*, *B. alveolatus* and *B. luridus* are regarded with suspicion. In using boleti for food it should be remembered that they should be picked when young and firm, and used at once, for they are exceedingly liable to decay. Yet the firmer sorts may be readily dried and kept for winter use. Those marked (!) are known to be excellent eating.

HOLLIS WEBSTER, *Secretary*.

Cambridge, July 13, 1897.

Boston Mycological Club.

Bulletin No. 3, 1897.

NOTICES. — On Saturday, Aug. 21st, prizes are offered for edible mushrooms by the Massachusetts Horticultural Society. Specimens to be exhibited should be on hand at nine o'clock, and must be ready for the judges at eleven.

A Meeting of the Club is called for three o'clock the same day at Horticultural Hall.

At the last meeting it was voted that the names of all applicants for membership should come before the Executive Committee for ratification.

An Excursion is announced for Friday, Aug. 27th, to East Holliston. Leave Boston and Albany at 10.32; return by 5.30; cost \$1.10. Send word to W. H. Burlen, East Holliston, Mass.

The secretary requests that all communications to him be addressed to Cambridge, Mass.

Those who have excursions to propose and who will lead them, and all who wish to be notified of excursions are requested to send their names to the Secretary.

It is hoped that every one is keeping a record of species found, and of species eaten, to serve as a basis for a report at the end of the season.

A special request is made that specimens of *Cyclomyces Greenii* (known by its concentric gills) and of the rarer sorts of woody fungi be collected and brought to the Saturday exhibitions or sent to the Secretary.

Arrangements have been made whereby books may be obtained or ordered at the hall on Saturdays.

Members are invited to bring in specimens of the smaller parasitic fungi (leaf moulds, blights, etc.), if they wish to know about them.

The season is unusually productive. Common mushrooms are abundant, and rare kinds are more frequently seen than usual. Doubtless the large number of fungus-hunters, "Pilz-freunde" as the Germans call us, has much to do with bringing to light the uncommon forms, some of which are almost certain to turn up at the Saturday exhibitions in Horticultural Hall. With such a rich crop and such an increasing host of mushroom eaters—so many of whom insist on having a dish of something, whether they are sure it is good or not—it is not surprising that the papers are reporting cases of poisoning, some of them fatal.

Even among the members of the Mycological Club—who ought to know better—there have been one or two instances where sickness has followed an ill-judged meal; and more than one member—fortunately so far without bad result—has carelessly confounded a kind to be avoided with one recommended. Such mistakes ought to work a suspension of the privileges of membership; at least any one careless about Amanitas should hardly expect to remain an active member. New members of the club, particularly those who are new to mushrooms as well, had best go slowly, and make acquaintance first with the poisonous kinds that they are sure to include in their first basketful. When they have learned to recognize these, and to avoid them, they may learn, one at a time, the commonest edible kinds, and should be satisfied if at the end of their first season they know half a dozen. What these kinds are may be learned from the various pamphlets and books available, or from

some one who *really knows*. All the general rules for guidance had best be dropped and these two adopted and lived up to :

1. Learn to know each kind of mushroom for itself, so that the names "Fairy Ring" and "Blusher" may have just as distinct a significance as the names "Bartlett" pear and "Baldwin" apple.

2 Unless you know beyond a doubt that a mushroom is safe to eat, don't eat it.

If a third recommendation were to be added to these, it would be that no mushroom that is too young to show its character or too old to be in good condition should be gathered for food, and that none should be kept long. If they must be kept at all, let them be prepared at once.

With regard to the first recommendation it is to be said that no permanent character, however unimportant, should be allowed to escape observation, and that characters that are critical, as aids to discrimination between good and noxious kinds, should be carefully noted and always sought for. As an example of the necessity of this the similarity in some respects of *Amanita Frostiana* and *A. Caesarea* may be cited. Both have yellow and orange tints; both a volva, veil, and ring; and, in spite of differences that distinguish them easily to one who is familiar with both, it has happened that *A. Frostiana*, considered poisonous, has been mistaken for the edible *A. Caesarea*. In one point, however, they differ absolutely. *A. Frostiana* has white gills, like *A. muscaria*, of which it has been called a variety, and the other *Amanitas*. *A. Caesarea* on the contrary has yellow gills. In *A. Frostiana*, however, the edge of the gills is not infrequently yellow, and thus may lead, and has led, the unwary into error.

Another example of possible confusion is to be found in *Amanita rubescens*, and some forms of the deadly *A. phalloides*. Both plants vary in color and in the relative prominence of their distinctive characters. *A. phalloides*, however, never has the peculiar wartiness of the typical *A. rubescens*. *A. rubescens* never has the volva of *A. phalloides*, nor its smell. In the character of "blushing" it would seem that *A. phalloides* may sometimes slightly imitate *A. rubescens*, as the latter certainly often simulates *A. phalloides* in the color of its cap.

A third instance where absolute accuracy in identification is necessary, one of the plants being deadly poisonous, is that of *Amanita verna* (or of white *A. phalloides*) and *Lepiota naucinoides*. Here the danger is not so great, for the plants do not grow together. The poisonous *Amanita*, which grows in the woods or on the edges of woods, is *shining white*, with gills that *stay* white, and has a distinct volva or margined swelling at the base. The edible *Lepiota*, which grows in grass land, and will soon be in season, is a *dull white*, with gills which turn slightly pinkish or dull colored soon after picking, and has a smooth bulbous base to the stem.

In the cases so far spoken of the consequences of mistake might be most serious. In the following the danger is not so great, or is entirely absent.

To confound *Russula furcata* with *R. virescens* does little harm. *R. furcata*, well cooked, may be eaten, but it is not so good as *virescens*. Raw, *R. furcata* has a disagreeable taste, whereas *virescens* is mild and sweet; the gills of *R. furcata* are conspicuously forked, whence the name, those of *virescens* are usually simple, or forked only at the base.

Again, *Lactarius hygrophoroides* is very like *L. volemus*, but has distant gills; both, however, are good to eat.

Marasmius oreades, the very familiar "Fairy Ring" mushroom, grows often with other kinds that look something like it. One of these is

Naucoria semi-orbicularis, another is a *Stropharia*. The *Naucoria* may be eaten in small quantity, especially if mixed with the *Marasmius*, and do no harm. Some people, indeed, eat it freely. Others, however, report that illness has been caused by it — violent and unpleasant, but not really dangerous. If this is true, then those who eat it for the first time should do so with caution. Nothing is so true in regard to mushrooms as the fact that what one person may eat another may not — and be comfortable. A serious attack of illness, for instance, is reported from the eating of the common pasture mushroom; but the victim was new to mushrooms, and may have suffered simply from aggravated indigestion. A more frequent cause of such attacks, however, is carelessness in gathering. Something that is not edible is gathered for what is. With the *Naucoria* for example, or the *Marasmius*, some species of *Stropharia* is also picked, retained in the picking over, cooked, and eaten. To avoid such a mischance all the kinds of little brown-topped mushrooms that grow in the grass must be examined carefully. *Marasmius oreades* with its umbo, its distant gills lighter in color than the cap, and its white spores must be separated from *Naucoria* with its dark gills and brown spores, and from *Stropharia* with its still darker gills, and darker spores, and (inconspicuous) ring. If eye and mind do not grasp these differences at once, they must be trained until they do. The same eyes and minds make much nicer distinctions between kinds and colors of dress materials, or between vegetables supplied by one market-gardener and another. Who is there that cannot tell a Florida orange from a Valencia, or a yellow plum from an apricot? If any such there be, let them get some one else to gather mushrooms for them.

LACTARIUS is at this season represented by many species. The following are to be looked for. E.= edible.

L. indigo Schw. Known by its blue color and blue juice. Reported from Middlesex Fells.

L. deliciosus Fr. Yellowish or grayish orange, with brighter spots and zones; gills orange, stained green when old; does the orange milk turn green? E. Mossy swamps, etc.

L. chelidonium Peck. Is duller colored than the last, with narrow gills; wounds turn blue, then green; milk saffron yellow. Dry places.

* In the following species the milk is at first white, then changes.

L. chrysorheus Fr. Umbilicate, becoming funnel form, yellowish, with bright zones and spots, margin involute at first; gills yellowish; stem hollow, glabrous; milk becoming yellow; acrid. Open woods.

L. theiogalus Fr. Pileus tawny red, with gray and yellow, slightly viscid; gills whitish or creamy, often showing brown stains; milk and cut flesh changing to sulphur yellow; tardily acrid. Redder and less acrid than the last. Common.

L. cilicioides Fr. Whitish flesh color, or buff, with long matted hairs covering the pileus; milk slowly changing to pale yellow; acrid.

L. scrobiculatus Fr. Resembles *L. theiogalus*, but the pileus is tomentose, and is more yellowish; stem is spotted, whereas that of the last is not; milk becomes sulphur yellow; acrid.

* In the following the white or whitish milk does not change.

L. turpis Fr. ? Cap and stem dark green and spotted. Moist woods.

L. trivialis Fr. Glabrous, viscid, leaden-gray, or ashy-brown, often with a pinkish tint, margin inflexed; gills close, adnate, whitish or creamy, staining dingy green; stem hollow, paler than the cap; spores yellowish; acrid.

L. hysginus Fr. Tan color or brownish red, viscid, margin inflexed; gills whitish, becoming cream colored; stem hollow or stuffed; spores yellowish white; acrid.

L. insulsus Fr. Viscid, more or less zonate, yellowish; gills whitish or pallid; stem hollowish, spotted; acrid.

L. glyciosmus Fr. Generally with a small umbo, minutely squamulose, grayish or brownish, with perhaps a tinge of pink; gills whitish or yellowish; stem generally stuffed; acrid or bitterish; with an agreeable smell.

L. helvus Fr. Var. *aquifluus*, Pk. Fragile, dry, subumbonate, silky or slightly scaly, pale or grayish red; gills decurrent, close, whitish ochraceous; stem soon hollow, slightly striate at the top; flesh often tinged with pinkish; milk sparse, watery, subacid or mild; with an aromatic scent when dry. Mossy wet ground.

L. vellereus Fr. White or whitish, velvety, soft to the touch, margin involute then reflexed; gills rather distant, becoming cream colored; stem tapering downward, pubescent; acrid. Common.

L. piperatus Fr. White, glabrous; distinguished easily from the last by its crowded narrow gills; intensely acrid. Common.

L. exsuccus Smith. Resembles *L. vellereus*, but is brittle and juiceless; stem very short; gills shaded with verdigris.

L. pyrogalus Fr. Generally zonate, ashy-brown, or lilac-brown; gills rather distant, yellowish; spores yellowish; acrid.

L. fuliginosus Fr. Dry, cap and stem smoky or buff-gray, with a dingy pruinosity; gills rather distant, stains pinkish; stem firm, stuffed; spores yellowish; tardily acrid. Thin woods, etc.

L. Gerardii Peck. Dry, umbonate, wrinkled, dingy brown; gills distant, whitish; spores white; mild. E.

L. lignyotus Fr. Similar to the last two but darker, almost sooty in appearance; wounds slowly turn salmon color; tardily acrid. Swamps, etc.

L. volemus Fr. Firm, dry, orange brown, varying to brown-red, or pale cream color, gills close, yellowish, staining brown; stem solid, colored like the cap; milk copious, mild. Common. E.

L. hygrophoroides B. & C. Easily mistaken for the last, which it resembles in every way except that the gills are far apart. Common. E.

L. luteolus Peck. Yellowish cream color, covered at first with a whiteish pruinosity, margin incurved at first; stem solid, short; gills staining dark brown or almost black; milk very copious, flowing at the slightest touch; flesh when cut turning grayish lilac and then darker; mild. Dry, rocky, wooded hillsides. Common about Boston.

L. corrugis Peck. Rugose, velvety, dark reddish brown or chestnut; gills creamy or light cinnamon, staining brownish; stem solid, paler than the cap; milk copious; mild. On the edges of the gills are numerous spicules. Thin woods.

L. camphoratus Fr. Thin, with a small umbo, glabrous, brownish red; gills thin, close, yellowish or reddish; stem stuffed or hollow; mild; smell agreeable, more distinct in the dried plant. E.

L. subdulcis Fr. Pileus thin, generally with an umbo or papilla, glabrous, even, of various shades of dark red; gills thin, close, whitish sometimes tinged with red; stem slender, sometimes villous at the base; mild, or slightly acrid, or bitterish; flesh often pinkish or reddish gray. Common everywhere and very variable. E.

These abridged descriptions are taken mainly from the synopsis of New York species by C. H. Peck, in the 38th Report of the N. Y. State Museum.

HOLLIS WEBSTER, *Secretary*.

Cambridge, Aug. 18, 1897.

Boston Mycological Club.

Bulletin No. 3, 1897.

NOTICES. — On Saturday, Aug. 21st, prizes are offered for edible mushrooms by the Massachusetts Horticultural Society. Specimens to be exhibited should be on hand at nine o'clock, and must be ready for the judges at eleven.

A Meeting of the Club is called for three o'clock the same day at Horticultural Hall.

At the last meeting it was voted that the names of all applicants for membership should come before the Executive Committee for ratification.

An Excursion is announced for Friday, Aug. 27th, to East Holliston. Leave Boston and Albany at 10.32; return by 5.30; cost \$1.10. Send word to W. H. Burlen, East Holliston, Mass.

The secretary requests that all communications to him be addressed to Cambridge, Mass.

Those who have excursions to propose and who will lead them, and all who wish to be notified of excursions are requested to send their names to the Secretary.

It is hoped that every one is keeping a record of species found, and of species eaten, to serve as a basis for a report at the end of the season.

A special request is made that specimens of *Cyclomyces Greenii* (known by its concentric gills) and of the rarer sorts of woody fungi be collected and brought to the Saturday exhibitions or sent to the Secretary.

Arrangements have been made whereby books may be obtained or ordered at the hall on Saturdays.

Members are invited to bring in specimens of the smaller parasitic fungi (leaf moulds, blights, etc.), if they wish to know about them.

The season is unusually productive. Common mushrooms are abundant, and rare kinds are more frequently seen than usual. Doubtless the large number of fungus-hunters, "Pilz-freunde" as the Germans call us, has much to do with bringing to light the uncommon forms, some of which are almost certain to turn up at the Saturday exhibitions in Horticultural Hall. With such a rich crop and such an increasing host of mushroom eaters—so many of whom insist on having a dish of something, whether they are sure it is good or not—it is not surprising that the papers are reporting cases of poisoning, some of them fatal.

Even among the members of the Mycological Club—who ought to know better—there have been one or two instances where sickness has followed an ill-judged meal; and more than one member—fortunately so far without bad result—has carelessly confounded a kind to be avoided with one recommended. Such mistakes ought to work a suspension of the privileges of membership; at least any one careless about *Amanitas* should hardly expect to remain an active member. New members of the club, particularly those who are new to mushrooms as well, had best go slowly, and make acquaintance first with the poisonous kinds that they are sure to include in their first basketful. When they have learned to recognize these, and to avoid them, they may learn, one at a time, the commonest edible kinds, and should be satisfied if at the end of their first season they know half a dozen. What these kinds are may be learned from the various pamphlets and books available, or from

some one who *really knows*. All the general rules for guidance had best be dropped and these two adopted and lived up to :

1. Learn to know each kind of mushroom for itself, so that the names "Fairy Ring" and "Blusher" may have just as distinct a significance as the names "Bartlett" pear and "Baldwin" apple.

- 2 Unless you know beyond a doubt that a mushroom is safe to eat, don't eat it.

If a third recommendation were to be added to these, it would be that no mushroom that is too young to show its character or too old to be in good condition should be gathered for food, and that none should be kept long. If they must be kept at all, let them be prepared at once.

With regard to the first recommendation it is to be said that no permanent character, however unimportant, should be allowed to escape observation, and that characters that are critical, as aids to discrimination between good and noxious kinds, should be carefully noted and always sought for. As an example of the necessity of this the similarity in some respects of *Amanita Frostiana* and *A. Caesarea* may be cited. Both have yellow and orange tints; both a volva, veil, and ring; and, in spite of differences that distinguish them easily to one who is familiar with both, it has happened that *A. Frostiana*, considered poisonous, has been mistaken for the edible *A. Caesarea*. In one point, however, they differ absolutely. *A. Frostiana* has white gills, like *A. muscaria*, of which it has been called a variety, and the other *Amanitas*. *A. Caesarea* on the contrary has yellow gills. In *A. Frostiana*, however, the edge of the gills is not infrequently yellow, and thus may lead, and has led, the unwary into error.

Another example of possible confusion is to be found in *Amanita rubescens*, and some forms of the deadly *A. phalloides*. Both plants vary in color and in the relative prominence of their distinctive characters. *A. phalloides*, however, never has the peculiar wartiness of the typical *A. rubescens*. *A. rubescens* never has the volva of *A. phalloides*, nor its smell. In the character of "blushing" it would seem that *A. phalloides* may sometimes slightly imitate *A. rubescens*, as the latter certainly often simulates *A. phalloides* in the color of its cap.

A third instance where absolute accuracy in identification is necessary, one of the plants being deadly poisonous, is that of *Amanita verna* (or of white *A. phalloides*) and *Lepiota naucinoïdes*. Here the danger is not so great, for the plants do not grow together. The poisonous *Amanita*, which grows in the woods or on the edges of woods, is *shining white*, with gills that *stay* white, and has a distinct volva or margined swelling at the base. The edible *Lepiota*, which grows in grass land, and will soon be in season, is a *dull white*, with gills which turn slightly pinkish or dull colored soon after picking, and has a smooth bulbous base to the stem.

In the cases so far spoken of the consequences of mistake might be most serious. In the following the danger is not so great, or is entirely absent.

To confound *Russula furcata* with *R. virescens* does little harm. *R. furcata*, well cooked, may be eaten, but it is not so good as *virescens*. Raw, *R. furcata* has a disagreeable taste, whereas *virescens* is mild and sweet; the gills of *R. furcata* are conspicuously forked, whence the name, those of *virescens* are usually simple, or forked only at the base.

Again, *Lactarius hygrophoroides* is very like *L. volemus*, but has distant gills; both, however, are good to eat.

Marasmius oreades, the very familiar "Fairy Ring" mushroom, grows often with other kinds that look something like it. One of these is

Naucoria semi-orbicularis, another is a *Stropharia*. The *Naucoria* may be eaten in small quantity, especially if mixed with the *Marasmius*, and do no harm. Some people, indeed, eat it freely. Others, however, report that illness has been caused by it — violent and unpleasant, but not really dangerous. If this is true, then those who eat it for the first time should do so with caution. Nothing is so true in regard to mushrooms as the fact that what one person may eat another may not — and be comfortable. A serious attack of illness, for instance, is reported from the eating of the common pasture mushroom; but the victim was new to mushrooms, and may have suffered simply from aggravated indigestion. A more frequent cause of such attacks, however, is carelessness in gathering. Something that is not edible is gathered for what is. With the *Naucoria* for example, or the *Marasmius*, some species of *Stropharia* is also picked, retained in the picking over, cooked, and eaten. To avoid such a mischance all the kinds of little brown-topped mushrooms that grow in the grass must be examined carefully. *Marasmius oreades* with its umbo, its distant gills lighter in color than the cap, and its white spores must be separated from *Naucoria* with its dark gills and brown spores, and from *Stropharia* with its still darker gills, and darker spores, and (inconspicuous) ring. If eye and mind do not grasp these differences at once, they must be trained until they do. The same eyes and minds make much nicer distinctions between kinds and colors of dress materials, or between vegetables supplied by one market-gardener and another. Who is there that cannot tell a Florida orange from a Valencia, or a yellow plum from an apricot? If any such there be, let them get some one else to gather mushrooms for them.

LACTARIUS is at this season represented by many species. The following are to be looked for. E.=edible.

L. indigo Schw. Known by its blue color and blue juice. Reported from Middlesex Fells.

L. deliciosus Fr. Yellowish or grayish orange, with brighter spots and zones; gills orange, stained green when old; does the orange milk turn green? E. Mossy swamps, etc.

L. chelidonium Peck. Is duller colored than the last, with narrow gills; wounds turn blue, then green; milk saffron yellow. Dry places.

* In the following species the milk is at first white, then changes.

L. chrysorheus Fr. Umbilicate, becoming funnel form, yellowish, with bright zones and spots, margin involute at first; gills yellowish; stem hollow, glabrous; milk becoming yellow; acrid. Open woods.

L. theiogalus Fr. Pileus tawny red, with gray and yellow, slightly viscid; gills whitish or creamy, often showing brown stains; milk and cut flesh changing to sulphur yellow; tardily acrid. Redder and less acrid than the last. Common.

L. cilicioides Fr. Whitish flesh color, or buff, with long matted hairs covering the pileus; milk slowly changing to pale yellow; acrid.

L. scrobiculatus Fr. Resembles *L. theiogalus*, but the pileus is tomentose, and is more yellowish; stem is spotted, whereas that of the last is not; milk becomes sulphur yellow; acrid.

* In the following the white or whitish milk does not change.

L. turpis Fr. ? Cap and stem dark green and spotted. Moist woods.

L. trivialis Fr. Glabrous, viscid, leaden-gray, or ashy-brown, often with a pinkish tint, margin inflexed; gills close, adnate, whitish or creamy, staining dingy green; stem hollow, paler than the cap; spores yellowish; acrid.

L. hysginus Fr. Tan color or brownish red, viscid, margin inflexed; gills whitish, becoming cream colored; stem hollow or stuffed; spores yellowish white; acrid.

L. insulsus Fr. Viscid, more or less zonate, yellowish; gills whitish or pallid; stem hollowish, spotted; acrid.

L. glyciosmus Fr. Generally with a small umbo, minutely squamulose, grayish or brownish, with perhaps a tinge of pink; gills whitish or yellowish; stem generally stuffed; acrid or bitterish; with an agreeable smell.

L. helvus Fr. Var. *aquifluus*, Pk. Fragile, dry, subumbonate, silky or slightly scaly, pale or grayish red; gills decurrent, close, whitish ochraceous; stem soon hollow, slightly striate at the top; flesh often tinged with pinkish; milk sparse, watery, subacid or mild; with an aromatic scent when dry. Mossy wet ground.

L. vellereus Fr. White or whitish, velvety, soft to the touch, margin involute then reflexed; gills rather distant, becoming cream colored; stem tapering downward, pubescent; acrid. Common.

L. piperatus Fr. White, glabrous; distinguished easily from the last by its crowded narrow gills; intensely acrid. Common.

L. exsuccus Smith. Resembles *L. vellereus*, but is brittle and *juiceless*; stem very short; gills shaded with verdigris.

L. pyrogalus Fr. Generally zonate, ashy-brown, or lilac-brown; gills rather distant, yellowish; spores yellowish; acrid.

L. fuliginosus Fr. Dry, cap and stem smoky or buff-gray, with a dingy pruinosity; gills rather distant, stains pinkish; stem firm, stuffed; spores yellowish; tardily acrid. Thin woods, etc.

L. Gerardii Peck. Dry, umbonate, wrinkled, dingy brown; gills distant, whitish; spores white; mild. E.

L. lignyotus Fr. Similar to the last two but darker, almost sooty in appearance; wounds slowly turn salmon color; tardily acrid. Swamps, etc.

L. volemus Fr. Firm, dry, orange brown, varying to brown-red, or pale cream color, gills close, yellowish, staining brown; stem solid, colored like the cap; milk copious, mild. Common. E.

L. hygrophoroides B. & C. Easily mistaken for the last, which it resembles in every way except that the gills are far apart. Common. E.

L. luteolus Peck. Yellowish cream color, covered at first with a whiteish pruinosity, margin incurved at first; stem solid, short; gills staining dark brown or almost black; milk very copious, flowing at the slightest touch; flesh when cut turning grayish lilac and then darker; mild. Dry, rocky, wooded hillsides. Common about Boston.

L. corrugis Peck. Rugose, velvety, dark reddish brown or chestnut; gills creamy or light cinnamon, staining brownish; stem solid, paler than the cap; milk copious; mild. On the edges of the gills are numerous spicules. Thin woods.

L. camphoratus Fr. Thin, with a small umbo, glabrous, brownish red; gills thin, close, yellowish or reddish; stem stuffed or hollow; mild; smell agreeable, more distinct in the dried plant. E.

L. subdulcis Fr. Pileus thin, generally with an umbo or papilla, glabrous, even, of various shades of dark red; gills thin, close, whitish sometimes tinged with red; stem slender, sometimes villous at the base; mild, or slightly acrid, or bitterish; flesh often pinkish or reddish gray. Common everywhere and very variable. E.

These abridged descriptions are taken mainly from the synopsis of New York species by C. H. Peck, in the 38th Report of the N. Y. State Museum.

HOLLIS WEBSTER, *Secretary*.

Cambridge, Aug. 18, 1897.

Boston Mycological Club.

Bulletin No. 4, 1897.

Prizes for Mushrooms. September 11th is the last day on which prizes are offered by the Massachusetts Horticultural Society (\$4, \$3, \$2). On other Saturdays, however, until the end of the season, the Club will offer, each day, a prize of \$1.00 for the best collection (of at least five kinds) of edible mushrooms, and a prize of 50c. for the best plate of a single species. Exhibits must be on the table by 11 o'clock.

In awarding these prizes particular attention will be paid to the **condition of specimens**, and those that are incomplete, dirty, or decayed will not be accepted.

The **name of the sender** should be affixed to all consignments by mail or express, whether they are sent to the Secretary or to the hall, for when several packages arrive at one time notice by mail is often insufficient.

All fungi brought in, whether for competition or not, should be gathered and handled with care, in order that they may reach the hall in good condition.

Miscellaneous collections of damaged fungi will not receive attention.

Colored labels of five kinds will hereafter be used, as follows: Edible and harmless species will be marked by white cards; poisonous by red; deleterious by pink; and those of unknown quality by blue.

Exhibition at Mechanic's Building. In connection with the Household Institute of the Boston Food Fair on October 8th there will be a lecture by Mrs. A. P. Doughty and also an exhibition of mushrooms. It is hoped that members who are interested in extending the educational work of the Club will volunteer to supply an abundance of such things as may be common at that season. Less common kinds, and specimens in poor condition, will not be serviceable for the purpose in mind, which is to make a striking exhibit of a few attractive mushrooms that can be recommended, and also of those poisonous or deleterious sorts that may be mistaken for them.

Bulletins. Members who have not received previous bulletins are requested to notify the Secretary at once, for the supply is running short. No. 1 can no longer be furnished. All who have not received Bulletin No. 53 of the U. S. Dept. of Agriculture are requested to send in their names without delay, in order that they may be included in the list about to be sent to Washington.

Excursions. On Friday, Sept. 17th, to Lynn Woods. Leave Union Station at 12.40. Package tickets will be provided. Short walks. Expense small.

At some time to be selected in the week beginning Sept. 27th, the Secretary will conduct one, and possibly two, excursions. Those who wish information about them are requested to send word to him.

Several of our members are also members of the Massachusetts Horticultural Society, which so kindly extends to us its hospitality every Saturday. It seems well to call attention to the fact that membership in the Society gives, among other privileges, access to a fine collection of valuable works on fungi, most of which contain colored plates. The other botanical works in the library are exceedingly helpful to students of botany, and many of them, like those on fungi, are much too costly for private ownership. The Secretary of the Mycological Club will be glad to hear from any members who may wish to be proposed for membership in the Horticultural Society.

If the notes that make up these bulletins of the Club seem to any to deal with simple and elementary matters, it must be remembered that many of those who are joining us are without knowledge of fungi and perhaps ignorant of botany, and that the prime object of the Club is educational. So far as possible the bulletins will try to meet some of the needs of all, and to be helpful to students as well as to would-be mycophagists. Queries and suggestions will be gladly received.

From those members who are not satisfied with knowing the half hundred common kinds that may be learned from the small popular books of Cooke, Gibson, Peck, or Michael come repeated inquiries for help in further study. They are continually finding species that they can not place, — that can not be found even in Stevenson, or Masee, or in Peck's Reports.*

To such inquiries the only answer must be a recommendation to patience — and perhaps to more careful study. Failure in identification may be due to difficulties in a subject not fully mastered — and hard to master; it may be due to incompleteness or other fault in the descriptions as printed, a supposition, unfortunately, only too well founded; it may be that a description which was originally made from a European or a British plant does not exactly fit the American representative of that plant, in which case the judgment of an expert is necessary, and the inexperienced student must remain in perplexity; or it may very well be that the plant in hand is not described in any book available, and possibly not described at all. For in the matter of fungi the American field is only partially explored, and we have as yet no Gray's Manual, or Chapman's Flora to guide us when we go abroad in it. What then is the poor impatient student to do? For of course he wants the names. The easiest way, and the most natural, is to ask somebody who can tell him. But such a somebody is not always within reach, nor can he always answer point-blank. Hence the recommendation to patience.

After all the name of a fungus or of any plant is not the vital thing. To be impatient for one, and to insist upon having it, if not from one source then from another, is to run the risk of going far astray. And in the pursuit of the name the plant itself is often neglected. When the label is neatly appended, there is often an end to curiosity and observation. Now the essential thing for us is to know the plant; to observe it as it grows, and in its different stages; and to compare it with others, and hence learn its true relationship. Recognizing it when we see it, we can name it, to ourselves, the "Red Lactarius from the Woodlot," or the "Sawmill Collybia," and keep track of it with our note book. In time, no doubt, the botanical name will be forth coming, and meanwhile we are getting better acquainted with our mushroom.

As to **nomenclature** it may be said that in the binomial system, in general use since the time of Linnaeus, the first of the names is that of the *genus* or group of closely related species to which a given plant belongs. The second name, in the form of an adjective, designates the *species*. In most cases generic and specific names are descriptive of some peculiarity of color or structure; sometimes also they indicate habitat, locality, or country, or are given in honor of some botanist. The abbreviation following is that of the name of the botanist who originally published the description of the species and gave the name. Thus *Cortinarius cinnamomeus* Fr. is the "*Cinnamon-colored Web-veiled Mushroom*," so named by Fries, the Swedish botanist, who first systematized the classification of fungi.

* The new edition of Peck's 48th Report, with plates, for which a hundred or more members are waiting, is expected in October. For these and other works of reference see Bulletin No. 2, or the list on the cover of Peck's "Mushrooms and Their Use," published by the Cambridge Botanical Supply Company.

For those unacquainted with Latin it may be added that the termination of the second name, the adjective, is governed by the gender of the first. Now it has happened that the names of many mushrooms have been changed, and that most of the changes have come about in this way. A large class of mushrooms, the Agarics proper, were grouped by Fries under the generic name *Agaricus*. In recent years, however, the subgenera of this large group have been given generic value with an effect on the names which may be indicated thus :

Agaricus procerus = *Lepiota procera*.
Agaricus ustalis = *Tricholoma ustale*.
Agaricus sericeus = *Entoloma sericeum*.
Agaricus prunulus = *Clitopilus prunulus*.

Foremost among the mushrooms to be expected at this season are of course the Pasture Mushroom and the Horse Mushroom. These and other species of the same genus (*Agaricus*), are described by Peck. So also is the Honey Mushroom, *Armillaria mellea*, which in various disguises, and usually in great abundance, may be looked for anywhere in the woods. Following this in appearance, but accompanying it to the end of the season the Bricktop may also be expected. Our common form of this mushroom, which is a *Hypholoma*, is called *H. perplexum* Pk., differing from the real *H. sublateritium* Schaeff., by its lack of bitter taste. Both the *Armillaria* and the *Hypholoma*, of which descriptions are appended, are rather coarse mushrooms, but if first scalded or boiled a little, they become more delicate, and may be converted into appetizing dishes.

We may expect also many species of *Tricholoma* and *Cortinarius*, the former recognizable among white spored species by their fleshy substance, absence of ring, and sinuate gills, the latter marked by red-brown or rusty brown spores, and filamentous veil. In both these genera identification is difficult. The *Cortinarii* particularly form a very large group, most of which show shades of blue or brown separately and in combination. If any are sent in to be examined they should be accompanied by notes on the following points: viscosity or dryness of stem, veil, and cap; color of the gills, when young and later; color of the flesh in cap and stem. Many *Tricholomas* and some *Cortinarii* are edible, and none are regarded as poisonous.

Another genus, in which most of the species are edible, largely represented in the autumn, is *Hygrophorus*. *Hygrophori* grow in damp or even wet places, usually in woods, and are recognized by their rather thick, somewhat waxy looking gills. Many of them display bright colors, yellows and reds; others are white. Although we have a large number of species, they are not familiar, for they often grow in places not easy or pleasant of access, and not comfortably explorable. But they well repay search, and one of them, due in October and November, is almost the very best mushroom we have. Brief descriptions of the commoner species will be given in the October Bulletin.

The following descriptions of mushrooms in season may be helpful :

Armillaria mellea Vahl. White spored, typically with a conspicuous collar, remnant of the membranous veil; stem stout, tall and fibrous; pileus when young forming a slightly conical yellowish, or greenish yellow ball elevated on the stem — when mature, broadly expanded, pale or dingy yellow, or brownish, generally minutely hairy in small tufts. Very variable, often ringless. Solitary or in dense clusters. E.

Armillaria robusta A. & S. Short, stocky, with very firm flesh, silvery gray or brownish; margin of pileus strongly inrolled at first, giving the plant, before the membranous veil breaks away, a peg-top shape; ring large, persistent, spreading. Dry woods, here and there about Boston.

Armillaria imperialis Fr.? A form near this or *A. ponderosa* Pk. has been sent from Maine. It is dull whitish, very large, thick, and heavy, and, before the outer veil breaks, resembling a tall puff ball. It has a double veil. More specimens are requested.

Hypholoma perplexum Pk. Pileus fleshy, convex then expanded, smooth, disk reddish paling to yellow near the margin; gills rounded near stem, from which they easily separate, pale yellow, then greenish, then purple brown as the spores ripen; stem hollow, yellowish, reddish below, fibrillose; flesh white; spores purplish brown. Taste mild. Singly or in dense clusters. E.

LEPIOTA, which has white spores, free gills, a universal veil, and a ring.

L. procera Scop. Brown, scurfy, strongly umbonate; ring movable; stem long, bulbous; smells nutty when old. Fields and woods. "The Parasol." E.

L. Americana Pk. Resembles somewhat the "Parasol," but is shorter, more fleshy, and of a red brown; stem enlarged near the base; ring flabby, often wanting. When bruised and wilted the flesh turns reddish. In grass land, generally in quantity where it occurs at all. E.

L. acutesquamosa Wein. A large, but not tall, brown species, known by the numerous erect pointed scales on the cap.

L. rachodes Vitt. Large, fleshy, rather short stemmed, with a dark or bay brown pileus, the surface of which breaks up into polygonal scales; plant globose at first; stem stout; ring large, movable, scaly beneath. Wounds become reddish. E.

L. excoriata Schaeff. Large, similar to the last, but lighter in color and with looser scales, more or less peeled at the margin; ring movable; flesh unchangeable. E.

L. cristata A & S. Small, 1'-2' high; pileus at first reddish brown, then white with brownish scales, and a central crest; stem hollow, whitish; ring small, white. In grassy places.

L. rubrotincta Pk. Similar to the last, but often pinkish, or reddish, and without the crest; ring well developed, persistent. Open places and greenhouses.

L. cepaestipes Sow. Pileus thin, expanded, covered with more or less mealy scales, which easily come off; stem tapering upward, enlarged near the base like the flowering stem of an onion, whence the name; ring thin. The color varies from brownish or yellowish to pure white. E.

L. naucinoides Pk. White, smooth, not shining; gills turning dull pinkish or soiled looking soon after picking or when old; stem generally thickened at the base; ring persistent, white. E.

L. mastoidea Fr. Rather small, with a thin-fleshed, broadly expanded, markedly umbonate pileus, which is fuscous and scaly; stem tapering from the base and sunk in the cap; ring entire, movable.

L. granulosa Batsch. Small, 1'-2' high, rough with granular scales, rusty or reddish yellow; gills not quite free; stem granular below the slight ring.

L. illinita Fr. White, viscid, smooth; much like a white *Hygrophorus*, but the gills are free.

L. licmophora B & Br. Lemon-yellow, very delicate, small, but tall in proportion, pileus deeply furrowed.

See further Synopsis by C. H. Peck in 35th Report of the N. Y. State Museum.

HOLLIS WEBSTER, *Secretary*.

Cambridge, Sept. 8, 1897.

Boston Mycological Club.

Bulletin No. 4, 1897.

Prizes for Mushrooms. September 11th is the last day on which prizes are offered by the Massachusetts Horticultural Society (\$4, \$3, \$2). On other Saturdays, however, until the end of the season, the Club will offer, each day, a prize of \$1.00 for the best collection (of at least five kinds) of edible mushrooms, and a prize of 50c. for the best plate of a single species. Exhibits must be on the table by 11 o'clock.

In awarding these prizes particular attention will be paid to the **condition of specimens**, and those that are incomplete, dirty, or decayed will not be accepted.

The **name of the sender** should be affixed to all consignments by mail or express, whether they are sent to the Secretary or to the hall, for when several packages arrive at one time notice by mail is often insufficient.

All fungi brought in, whether for competition or not, should be gathered and handled with care, in order that they may reach the hall in good condition.

Miscellaneous collections of damaged fungi will not receive attention.

Colored labels of five kinds will hereafter be used, as follows: Edible and harmless species will be marked by white cards; poisonous by red; deleterious by pink; and those of unknown quality by blue.

Exhibition at Mechanic's Building. In connection with the Household Institute of the Boston Food Fair on October 8th there will be a lecture by Mrs. A. P. Doughty and also an exhibition of mushrooms. It is hoped that members who are interested in extending the educational work of the Club will volunteer to supply an abundance of such things as may be common at that season. Less common kinds, and specimens in poor condition, will not be serviceable for the purpose in mind, which is to make a striking exhibit of a few attractive mushrooms that can be recommended, and also of those poisonous or deleterious sorts that may be mistaken for them.

Bulletins. Members who have not received previous bulletins are requested to notify the Secretary at once, for the supply is running short. No. 1 can no longer be furnished. All who have not received Bulletin No. 53 of the U. S. Dept. of Agriculture are requested to send in their names without delay, in order that they may be included in the list about to be sent to Washington.

Excursions. On Friday, Sept. 17th, to Lynn Woods. Leave Union Station at 12.40. Package tickets will be provided. Short walks. Expense small.

At some time to be selected in the week beginning Sept. 27th, the Secretary will conduct one, and possibly two, excursions. Those who wish information about them are requested to send word to him.

Several of our members are also members of the Massachusetts Horticultural Society, which so kindly extends to us its hospitality every Saturday. It seems well to call attention to the fact that membership in the Society gives, among other privileges, access to a fine collection of valuable works on fungi, most of which contain colored plates. The other botanical works in the library are exceedingly helpful to students of botany, and many of them, like those on fungi, are much too costly for private ownership. The Secretary of the Mycological Club will be glad to hear from any members who may wish to be proposed for membership in the Horticultural Society.

If the notes that make up these bulletins of the Club seem to any to deal with simple and elementary matters, it must be remembered that many of those who are joining us are without knowledge of fungi and perhaps ignorant of botany, and that the prime object of the Club is educational. So far as possible the bulletins will try to meet some of the needs of all, and to be helpful to students as well as to would-be mycophagists. Queries and suggestions will be gladly received.

From those members who are not satisfied with knowing the half hundred common kinds that may be learned from the small popular books of Cooke, Gibson, Peck, or Michael come repeated inquiries for help in further study. They are continually finding species that they can not place, — that can not be found even in Stevenson, or Massee, or in Peck's Reports.*

To such inquiries the only answer must be a recommendation to patience — and perhaps to more careful study. Failure in identification may be due to difficulties in a subject not fully mastered — and hard to master; it may be due to incompleteness or other fault in the descriptions as printed, a supposition, unfortunately, only too well founded; it may be that a description which was originally made from a European or a British plant does not exactly fit the American representative of that plant, in which case the judgment of an expert is necessary, and the inexperienced student must remain in perplexity; or it may very well be that the plant in hand is not described in any book available, and possibly not described at all. For in the matter of fungi the American field is only partially explored, and we have as yet no Gray's Manual, or Chapman's Flora to guide us when we go abroad in it. What then is the poor impatient student to do? For of course he wants the names. The easiest way, and the most natural, is to ask somebody who can tell him. But such a somebody is not always within reach, nor can he always answer point-blank. Hence the recommendation to patience.

After all the name of a fungus or of any plant is not the vital thing. To be impatient for one, and to insist upon having it, if not from one source then from another, is to run the risk of going far astray. And in the pursuit of the name the plant itself is often neglected. When the label is neatly appended, there is often an end to curiosity and observation. Now the essential thing for us is to know the plant; to observe it as it grows, and in its different stages; and to compare it with others, and hence learn its true relationship. Recognizing it when we see it, we can name it, to ourselves, the "Red Lactarius from the Woodlot," or the "Sawmill Collybia," and keep track of it with our note book. In time, no doubt, the botanical name will be forth coming, and meanwhile we are getting better acquainted with our mushroom.

As to **nomenclature** it may be said that in the binomial system, in general use since the time of Linnaeus, the first of the names is that of the *genus* or group of closely related species to which a given plant belongs. The second name, in the form of an adjective, designates the *species*. In most cases generic and specific names are descriptive of some peculiarity of color or structure; sometimes also they indicate habitat, locality, or country, or are given in honor of some botanist. The abbreviation following is that of the name of the botanist who originally published the description of the species and gave the name. Thus *Cortinarius cinnamomeus* Fr. is the "*Cinnamon-colored Web-veiled Mushroom*," so named by Fries, the Swedish botanist, who first systematized the classification of fungi.

* The new edition of Peck's 48th Report, with plates, for which a hundred or more members are waiting, is expected in October. For these and other works of reference see Bulletin No. 2, or the list on the cover of Peck's "Mushrooms and Their Use," published by the Cambridge Botanical Supply Company.

For those unacquainted with Latin it may be added that the termination of the second name, the adjective, is governed by the gender of the first. Now it has happened that the names of many mushrooms have been changed, and that most of the changes have come about in this way. A large class of mushrooms, the Agarics proper, were grouped by Fries under the generic name *Agaricus*. In recent years, however, the subgenera of this large group have been given generic value with an effect on the names which may be indicated thus :

Agaricus procerus = *Lepiota procera*.
Agaricus ustalis = *Tricholoma ustale*.
Agaricus sericeus = *Entoloma sericeum*.
Agaricus prunulus = *Clitopilus prunulus*.

Foremost among the mushrooms to be expected at this season are of course the Pasture Mushroom and the Horse Mushroom. These and other species of the same genus (*Agaricus*), are described by Peck. So also is the Honey Mushroom, *Armillaria mellea*, which in various disguises, and usually in great abundance, may be looked for anywhere in the woods. Following this in appearance, but accompanying it to the end of the season the Bricktop may also be expected. Our common form of this mushroom, which is a *Hypholoma*, is called *H. perplexum* Pk., differing from the real *H. sublateritium* Schaeff., by its lack of bitter taste. Both the *Armillaria* and the *Hypholoma*, of which descriptions are appended, are rather coarse mushrooms, but if first scalded or boiled a little, they become more delicate, and may be converted into appetizing dishes.

We may expect also many species of *Tricholoma* and *Cortinarius*, the former recognizable among white spored species by their fleshy substance, absence of ring, and sinuate gills, the latter marked by red-brown or rusty brown spores, and filamentous veil. In both these genera identification is difficult. The *Cortinari* particularly form a very large group, most of which show shades of blue or brown separately and in combination. If any are sent in to be examined they should be accompanied by notes on the following points: viscidiness or dryness of stem, veil, and cap; color of the gills, when young and later; color of the flesh in cap and stem. Many *Tricholomas* and some *Cortinari* are edible, and none are regarded as poisonous.

Another genus, in which most of the species are edible, largely represented in the autumn, is *Hygrophorus*. *Hygrophori* grow in damp or even wet places, usually in woods, and are recognized by their rather thick, somewhat waxy looking gills. Many of them display bright colors, yellows and reds; others are white. Although we have a large number of species, they are not familiar, for they often grow in places not easy or pleasant of access, and not comfortably explorable. But they well repay search, and one of them, due in October and November, is almost the very best mushroom we have. Brief descriptions of the commoner species will be given in the October Bulletin.

The following descriptions of mushrooms in season may be helpful :

Armillaria mellea Vahl. White spored, typically with a conspicuous collar, remnant of the membranous veil; stem stout, tall and fibrous; pileus when young forming a slightly conical yellowish, or greenish yellow ball elevated on the stem — when mature, broadly expanded, pale or dingy yellow, or brownish, generally minutely hairy in small tufts. Very variable, often ringless. Solitary or in dense clusters. E.

Armillaria robusta A. & S. Short, stocky, with very firm flesh, silvery gray or brownish; margin of pileus strongly inrolled at first, giving the plant, before the membranous veil breaks away, a peg-top shape; ring large, persistent, spreading. Dry woods, here and there about Boston.

Armillaria imperialis Fr.? A form near this or *A. ponderosa* Pk. has been sent from Maine. It is dull whitish, very large, thick, and heavy, and, before the outer veil breaks, resembling a tall puff ball. It has a double veil. More specimens are requested.

Hypholoma perplexum Pk. Pileus fleshy, convex then expanded, smooth, disk reddish paling to yellow near the margin; gills rounded near stem, from which they easily separate, pale yellow, then greenish, then purple brown as the spores ripen; stem hollow, yellowish, reddish below, fibrillose; flesh white; spores purplish brown. Taste mild. Singly or in dense clusters. E.

LEPIOTA, which has white spores, free gills, a universal veil, and a ring.

L. procera Scop. Brown, scurfy, strongly umbonate; ring movable: stem long, bulbous; smells nutty when old. Fields and woods. "The Parasol." E.

L. Americana Pk. Resembles somewhat the "Parasol," but is shorter, more fleshy, and of a red brown; stem enlarged near the base; ring flabby, often wanting. When bruised and wilted the flesh turns reddish. In grass land, generally in quantity where it occurs at all. E.

L. acutesquamosa Wein. A large, but not tall, brown species, known by the numerous erect pointed scales on the cap.

L. rachodes Vitt. Large, fleshy, rather short stemmed, with a dark or bay brown pileus, the surface of which breaks up into polygonal scales; plant globose at first; stem stout; ring large, movable, scaly beneath. Wounds become reddish. E.

L. excoriata Schaeff. Large, similar to the last, but lighter in color and with looser scales, more or less peeled at the margin; ring movable; flesh unchangeable. E.

L. cristata A & S. Small, 1'-2' high; pileus at first reddish brown, then white with brownish scales, and a central crest; stem hollow, whitish; ring small, white. In grassy places.

L. rubrotincta Pk. Similar to the last, but often pinkish, or reddish, and without the crest; ring well developed, persistent. Open places and greenhouses.

L. cepaestipes Sow. Pileus thin, expanded, covered with more or less mealy scales, which easily come off; stem tapering upward, enlarged near the base like the flowering stem of an onion, whence the name; ring thin. The color varies from brownish or yellowish to pure white. E.

L. naucinoides Pk. White, smooth, not shining; gills turning dull pinkish or soiled looking soon after picking or when old; stem generally thickened at the base; ring persistent, white. E.

L. mastoidea Fr. Rather small, with a thin-fleshed, broadly expanded, markedly umbonate pileus, which is fuscous and scaly; stem tapering from the base and sunk in the cap; ring entire, movable.

L. granulosa Batsch. Small, 1'-2' high, rough with granular scales, rusty or reddish yellow; gills not quite free; stem granular below the slight ring.

L. illinita Fr. White, viscid, smooth; much like a white *Hygrophorus*, but the gills are free.

L. licmophora B & Br. Lemon-yellow, very delicate, small, but tall in proportion, pileus deeply furrowed.

See further Synopsis by C. H. Peck in 35th Report of the N. Y. State Museum.

HOLLIS WEBSTER, *Secretary*.

Cambridge, Sept. 8, 1897.

Boston Mycological Club.

Bulletin No. 5, 1897.

Meeting. On Saturday Oct. 16th at 2.30 a meeting will be held in Horticultural Hall. Talks are expected on the fungi of the season and on the cultivation of mushrooms.

Members are reminded that the Saturday exhibitions will continue until the end of the season, that is, until the middle of November; that prizes are offered every week for the best plate of mushrooms, and for the best collection of at least five kinds; that talks may be expected every Saturday at three or a little earlier, and sometimes, if occasion serves, between twelve and one. In these talks the attempt is made to give help to new members whose experience is slight.

The season is so dry that unusual diligence is recommended to those who have a chance to collect, in order that sufficient material may be on hand. Many things may still be had in moist places in the woods, in swamps and on their borders. Search is necessary, for often the leaves must be brushed away. Quantities of mushrooms, otherwise invisible, are often revealed in this way,—a remark which applies particularly to species of *Tricholoma* and *Hygrophorus*.

A mushroom which is being brought to notice is *Lepiota rachodes*. It is not common, but has here and there been found in rich soil, sometimes in greenhouses. It is large and has thick firm flesh, points which have recommended it for cultivation. It is now being raised and put on the market, and, it is hoped, will take its place in public estimation with the Field and Horse mushrooms. No doubt other mushrooms would submit to cultivation. Experiments with certain varieties have already demonstrated that they may be grown successfully. It has proved impossible, however, to get market-men to sell, or people to buy them, so strong is the prejudice against new kinds about which there is no tradition. This latest experiment will be watched with interest. Specimens of the new mushroom, and possibly a few words from the grower, are expected at the next meeting.

Another *Lepiota*, *L. naucinoides*, should now put in an appearance. A description of it is in Bull. No. 4, and notes about its resemblance to a poisonous amanita are to be found in Bull. No. 3.

Those whose interest in fungi is not confined to edibility, may like to have their attention called to another economic quality,—their destructiveness to growing trees.* Everyone presumably knows that fungi draw their food supply either from dead and decaying organic matter, or from the tissues of living organisms. Trees, in particular, suffer from fungi in a great variety of ways. On the bark, and on the leaves, the microscopic fructifications of many parasitic fungi may everywhere be detected. For a single tree the list of such parasites is often a long one, including a dozen or a score of species. These are so inconspicuous, however, and so difficult of observation that they escape the notice of any but the specialist.

The larger parasites, on the contrary, may easily be seen and examined by the ordinary observer, and most of them belong to the familiar group of the Polyporeae. An example is *Polyporus sulphureus*, which is to be found on many sorts of trees. Wherever a wound from any source has broken the bark and exposed the tender growing tissues that lie just within it, or where the cut or broken stump of a branch shows an unprotected surface, spores of the fungus may fall and germinate. The delicate white threads (mycelium) of the plant, extending and branching, make their way into the cells of the softer parts of the trunk, absorb the

* A clear and detailed popular account of this and kindred matters may be found in "Timber and Some of its Diseases," by Professor H. Marshall Ward.

nourishment prepared by the tree for its own use, and even consume a part of the substance of the cells themselves. After a time, in a tree thus affected, white, felt-like masses of the fungus may be found filling the spaces that it has eaten out in the interior of the wood. The tree naturally suffers, and will eventually be killed. The presence of the parasite becomes fatal to it. After a time, and at the appropriate season, the triumphant fungus displays its brilliant-flame colored fructification on the trunk of the tree, making its victim flaunt the colors of the conqueror.

Among the Agarics, also, a few are destructive to trees, in particular *Armillaria mellea*. Whole plantations of trees are sometimes overrun by the destroyer, which is so insidious in its attacks that great watchfulness is required on the part of the forester to keep his trees free from it. This fungus possesses a mycelium of peculiar form. It is collected in tough long branching strands like roots, black and somewhat shiny. On a tree attacked by the fungus these rootlike bodies (rhizomorphs) may be discovered under the bark, in the substance of the wood, and also in the roots. Rootlike themselves in appearance, they are also rootlike in habit; for they reach out into the ground, not far below the surface, and sometimes grow to the length of several feet. In this way they may pass from the roots of one tree to those of another, and thus, if unchecked, carry disease and death to many trees surrounding that first attacked.

To those who have opportunity and interest the suggestion is made to secure specimens of these and other parasites which shall show plainly their destructive work. Such specimens can not be secured without some effort, and may require the use of spade and saw. If sufficient material can be gathered, it may serve to illustrate a talk at one of the coming meetings. Good specimens will be welcomed by Dr. Farlow for the permanent exhibition at the Agassiz Museum in Cambridge.

Tricholoma. This genus is known among white-spored agarics by its sinuate gills. The gills, that is to say, at the inner end are rounded upward and often attached to the stem by a little tooth.

None of the species are poisonous, though several are ill-flavored. Those marked E are recommended as edible.

The following may be looked for :

T. equestre L. Pileus fleshy, viscid when moist, pale yellowish; flesh white or yellowish; gills nearly free, close, sulphur yellow.

T. sejunctum Sow. Pileus fleshy, umbonate, slightly viscid, with dark fibrils on a yellowish or greenish-yellow ground, variable; flesh white fragile; gills broad, rather distant; stem stout, solid, often irregular. A large form, often very abundant, with the prevailing color yellow, often very dark cap, and with a tendency to show reddish tints in the stem and flesh, has been referred to this species. It has a mealy taste, and is a good, though rather coarse vegetable. E.

T. portentosum Fr. Pileus broad, smoky, often (with us) violaceous, thin in comparison with the stem, somewhat umbonate, unequal and repand, viscid when moist, streaked with fibrils, but smooth to the touch; flesh white, fragile; stem stout, solid, fibrous-fleshy, striate, white; gills broad, rounded, almost free, white but becoming pale grey or yellow, Odor none. Taste mild, pleasant. In pine woods and under firs, often under the needles. To be distinguished from *T. terreum*. E.

T. resplendens Fr. White, sometimes yellowish on the disk, shining when dry; distinguished from all other white species by its viscosity.

T. Russula Schaeff. Large, fleshy, becoming centrally depressed; distinguished by its pale red or flesh color and by the red stains which appear on the gills. E.

T. ustale Fr. Bay-brown-rufous, of a scorched appearance like an over-baked biscuit, umbonate then plane, even, not streaked; flesh white, becoming reddish in spots; stem long, at length hollow, dry, fibrillose; gills emarginate, crowded, rather broad, white, then reddish. E.

T. rutilans Schaeff. Pileus dry, fleshy, covered at first with a dark red tomentum, which breaks up into scales; flesh yellow; gills crowded, yellow, villose on the edge; stem long, hollowish, yellow, with red scales. A well marked species. On stumps, etc., chiefly of pine. E.

T. columbetta Fr. Dove color, (if the dove is white), fleshy, obtuse, rather flexuous, dry, becoming silky or squamulose; margin at first involute; flesh white; gills close, white; stem solid, unequal, white. Taste mild. E.

T. imbricatum Fr. Pileus compact, obtuse, dry, innately squamulose, (reddish) brown, the thin margin at first slightly inflexed and pubescent, then naked; gills slightly emarginate, white, becoming spotted or reddish; flesh white; stem solid, mealy white at the top, reddish brown below. Smell and taste mealy. E.

T. vaccinum Pers. Pileus fleshy, umbonate, dry, campanulate, then expanded, scaly, reddish brown, margin involute and tomentose; flesh white; gills adnexed, becoming reddish and spotted; stem hollow, covered with a layer of fibrils, whitish rufescent, naked at the apex. Taste farinaceous, not agreeable.

T. terrenum Schaeff. Pileus fleshy, thin, soft, obtuse or umbonate, innately fibrillose or scaly, dull smoky, or ashy brown, or mouse color; flesh white or whitish; gills rather distant, adnexed, becoming eroded on the edge, white, becoming cinereous; stem variable, solid to hollow, fibrillose, white or whitish. Very variable. E.

T. album Schaeff. Pileus fleshy, tough, sometimes becoming depressed, very dry, glabrous, white, sometimes yellowish at the disk, or wholly yellowish, margin involute at first; flesh white, gills emarginate, white; stem solid, elastic, externally fibrous, white. Taste acrid or bitter.

T. personatum Fr. Pileus compact, becoming soft, thick, becoming plane, regular, moist, glabrous, variable in color, but generally pallid or ashy with a violet or lilac tint, margin involute at first and villose-pruinose; flesh whitish; gills broad, crowded, rounded near the stem, free violaceous or dingy; stem variable, solid, fibrillose villose-pruinose, colored like the pileus; spores sordid-white. Common, often very large. E.

T. nudum Bull. Pileus fleshy, comparatively thin, violaceous, then pale or brownish; margin inflexed, naked; flesh pliant, colored; stem stuffed, elastic, mealy at the top, becoming pale; gills becoming decurrent, violaceous at first. E.

T. sordidum Fr. Pileus thin, sometimes with a small umbo, finally depressed, often misshapen, glabrous, hygrophanous, brown with a violaceous or reddish tint, when moist striatulate on the margin, sordid when dry; flesh white; gills thin, violaceous or smoky; stem solid or stuffed, striate, colored like the pileus, white within. Grows in the spring.

Hygrophorus. This genus is one of those which differ from proper agarics by the fact that the substance of the cap descends, as a trama, between the gill plates. The gills are waxy, and not membranaceous, and contain a watery juice. Many of the species are edible; none are known to be poisonous, although *H. conicus* has that reputation.

The following are among the familiar species:

H. chrysodon Fr. Pileus not thick, 1'-2' wide, viscid when moist, white, often yellow at the disk, margin dotted with yellowish scales, which appear also on the stem; gills slightly arcuate [*i. e.* the outline in the form of a bow], decurrent, distant, white, sometimes with a faint pink tinge; stem 2'-3' high, slightly thinner below, solid, white.

H. eburneus Fr. Shining white, fleshy, or thin, somewhat repand, even very glutinous in wet weather, margin soon naked; gills decurrent, distant, veined at the base, broad, entire, straight; stem variable in length, becoming hollow, glutinous, rough at the apex with scaly dots. E.

H. erubescens Fr. Pileus broad, white, becoming reddish, fleshy, at first gibbous, viscid, at first with adpressed scales, margin naked; flesh firm, white; gills decurrent, distant, soft, white, red-spotted; stem robust, thinner upwards, sometimes long, solid, with red fibrils and dots.

H. limacinus Fr. Pileus fleshy, smooth, viscid, becoming flattened, disk umber then fuliginous, paler round the margin; flesh white; gills adnate, then decurrent, somewhat distant, thin, white becoming slightly ashy; stem thick, solid, firm, viscous, ventricose, striate; roughened with squamules at the top.

H. fuliginus Frost. Pileus becoming plane, smooth, glutinous, smoky brown, the disk darker, even almost black, margin sometimes wavy or irregular, and in old age reflexed; flesh white; gills adnate or decurrent, subdistant, white, often with veins in the inter-spaces; stem variable, solid, glutinous, white, or stained with smoky brown, with a silky white space free from gluten at the top. A large species, as are the preceding four, growing in moist woods under pines. E.

H. flavodiscus Frost. Similar in all points of structure to the last, but yellow; very viscid in the young stage. Grows with the last, but less abundantly. Much superior to the last in flavor, and one of the very best of edible mushrooms. E.

H. hypothejus Fr. Smaller than the preceding, pileus at first smeared with olivaceous gluten, then cinereous, becoming pale and even orange, thin, at length depressed; flesh white, becoming yellow; gills decurrent, distant, pallid but soon yellow or flesh color; stem stuffed, viscous, at length hollow; veil fugacious. Very variable. Dry soil under pines. E.

H. virgineus Fr. Wholly white. Pileus fleshy, moist (not viscid) obtuse then depressed, cracked and floccose when dry; gills decurrent, distant, rather thick; stem curt, stuffed, firm, thinner towards the base, even and naked. To be distinguished from the next. E.

H. niveus Fr. Wholly white. Smaller than the last, somewhat membranaceous, striate and viscid when moist, not cracked when dry, umbilicate, hygrophanous; flesh thin; gills distant, decurrent, thin, arcuate; stem thick, fistulose, equal, tense and straight. E.

H. coccineus Fr. Bright scarlet, then pale, slightly fleshy, often unequal, obtuse, at first viscid, smooth; flesh of same color as pileus; gills adnate, decurrent with a tooth, distant, connected by veins, soft as if fatty, when full grown purplish at the base; stem thick, hollow, compressed, even, not slippery, scarlet above, always yellow at the base. E.

H. miniatus Fr. Smaller than the last, at first vermilion, then pale and opaque, finally umbilicate and squamulose; gills adnate, distant, distinct, yellow; stem long in proportion, stuffed, round, smooth, shining, vermilion. E.

H. puniceus Fr. Often large, (2'-4'), blood-scarlet, becoming pale, obtuse, commonly repand and irregular, smooth and viscid; flesh of same color; gills ascending, ventricose (in contrast to those of *H. coccineus*), broad, thick, distant, white or yellow, and often reddish at the base; stem at length hollow, stout, ventricose, attenuated at both ends, striate, usually scaly at the apex, always white and often incurved at the base, otherwise yellow or red. E.

Other species are found through the season, but they are for the most part small and, though interesting, difficult to identify, and hardly of edible value.

For Synopsis of N. Y. Species of *Tricholoma* by C. H. Peck see the 44th Report of the N. Y. State Museum.

HOLLIS WEBSTER, *Secretary*.

Cambridge, Oct. 13th, 1897.

Boston Mycological Club.

Bulletins Nos. 6 and 7.

(Issued, July, 1898).

DUES (\$1.00) FOR THE YEAR 1898-99 ARE PAYABLE any time after May 1st. Bills will not be sent, however, except to those who fail to regard this notice.

At the annual meeting held April 30th the following officers were elected: President, Dr. George E. Francis; Vice-president, William C. Bates; Secretary and Treasurer, Hollis Webster; Executive Committee (in addition to the officers) Dr. R. T. Dearborn, Miss M. C. Hallett, Mrs. F. A. Pierce, George B. Fessenden. Miss Helen M. Noyes has since been appointed to take charge of the exhibitions for the season, and to assist the secretary.

The secretary's report for 1897-98 called attention to the fact that at the last annual meeting it was voted that the financial year should begin on May 1st; that on that date members three months in arrears should be dropped; and that the fee of new members joining after February first should cover the dues of the year next succeeding.

The MEMBERSHIP of the Club increased from 200+ in 1897 to over 400 on April 30th, 1898. The exact membership at a given date can only be given approximately owing to unavoidable uncertainty as regards certain names on the list. It is proposed to publish annually a club book for which, the dues being so low, a small charge will perhaps be made.*

During the year five Bulletins were published, with a total of eighteen pages. A number of excursions were made. Exhibitions under the efficient charge of Miss Ellen W. Rumrill were held on every Saturday throughout the season from May until November, and in connection with these there were informal talks.

Meetings were held as follows for special discussion and lectures:

July 24th. Mushrooms and the Chafing-dish. Mrs. A. P. Doughty.

Oct. 16th. Cultivation of Mushrooms; discussion.

Dec. 18th. Methods of Drying and Preserving Edible Mushrooms; an extensive exhibition.

Dec. 22nd. Exhibition of sketches in color, of photographs, and of lantern slides.

March 9th, 23rd, and April 7th, three class lectures on Structure and Classification, illustrated by lantern, photographs, plates, and Herpel specimens, with notes on books of reference.

* All members who note any incorrectness in the address at present employed by the secretary are requested to write him at once, for the club list is soon to be printed. He would be glad to hear from every one without exception.

The Club during the year brought its collection of slides up to the number of two hundred.

In all these various ways the first and main purpose of the Club, that of education and guidance in the study of edible and poisonous fungi, was carried out.

The Treasurer's report showed that the receipts of the Club applicable to the year (\$376.00) were exceeded by the expenditures (\$388.00); the deficit being met out of the balance (\$48.00) on hand May 1st, 1897. In addition to this \$4.00 was received for arrears, and \$22.00 for dues paid in advance. From these data the actual paid up membership (about 400) is reckoned.

Since the formation of the Boston Mycological Club, other similar Clubs have been formed in Dedham, Mass.; in New York, N. Y.; in Washington, D. C., and in Philadelphia, Pa.

In Harper's Bazar for June 26th, 1897, was published an account of the "Westfield Toadstool Club" of Westfield, N. Y. organized on March 6th, 1895. This club antedates the B. M. C. by over five months. It is especially to be commended for choosing a title which is in actual correspondence with its objects and work. The B. M. C. so far has not proved its right to its more comprehensive name, but it is making a beginning to extend its field of work, as will be seen in the announcements and in the following note on the President's remarks at the annual meeting.

The President of the Club, Dr. Francis, reviewed the work of the year from the scientific side, and spoke of the need of more accurate and extended studies in regard to the season, habitat, and distribution of species that are familiar or that can be easily identified; also of the value of such data as can be gathered in regard to unfamiliar plants. The importance of such work he would insist on, not to the exclusion of the popular and more generally interesting purpose of the Club, but as a necessary adjunct and basis for that work, if it is to have value. Chief among our needs are: 1, a complete and accurate list of species already found in the country, or at least in the northeastern portion of it; 2, some expert authority to visit our exhibitions and deal in a final way with the specimens gathered.

Both of these desiderata are at present beyond our reach, but it is quite within our power to preserve notes and specimens in such form and condition that they may serve, when submitted to some competent authority, to enable the species to be determined. As a beginning, to make this part of the work more effective, the Executive Committee, to whom discretion in the matter was given, has deemed it wise to engage the services of a trained botanical student, to whom has been entrusted, in addition to the care of the exhibitions, the more important task of beginning collections for a herbarium.

ANNOUNCEMENTS.

A MEETING is called for Saturday, July 16th, at Horticultural Hall at 3 P. M. On Saturday, July 23rd, which is the first prize day for mushrooms, there will be an informal talk at 3 o'clock when the exhibition closes. Similar talks will frequently be given in connection with the regular weekly exhibitions.

Members are urged to interest themselves in the exhibitions and to bring in specimens. These should be at the hall before 10 A. M., and the exhibitor should place with every species his own name and a note of

the locality and habitat, All material should be carefully gathered, and brought in good condition.

EXCURSIONS. On Friday, July 15th, a party will leave the Union Station at 12.40 for Lynn Woods. Expense small.

Notices of other excursions will be published in the Boston Transcript in the southeast corner of the editorial page. The size of the Club makes individual notices too expensive. But the Secretary will send special word to any member who will send him an addressed card.

BULLETINS. Although the bulletins are delayed, the plan of issuing six has not been given up. A price of 50 cents has been fixed for the bulletins of 1897; nos. 2-5 can be supplied. Every member should have received a copy of Bull. No. 15, of the Division of Vegetable Physiology and Pathology, U. S. Dep't of Agriculture. Those who do not get it should send an individual personal request to the Department at Washington. The same advice may be given regarding Farmers' Bulletin No. 53. Of these the former contains an illustrated article by Dr. Farlow on "Some Edible and Poisonous Fungi," the latter is on "The Cultivation of Mushrooms."

A CLUB HERBARIUM. Under the care of Miss Noyes a nucleus for an herbarium has been formed, and a principal object of the year will be to add to this nucleus. The attempt will be made to preserve the interesting forms which appear at the exhibitions, particularly those whose determination is impossible or uncertain. Of these plants full notes will be kept. Exhibition specimens of typical forms will also be made for use at the winter lectures.

Those who feel that they can assist in this work and contribute to the Club Herbarium are requested to write to the secretary. Full directions for collection and preservation can be had nowhere better than in an article by Dr. Edward A. Burt in the Botanical Gazette for March of this year. A reprint of this is published by the Botanical Supply Co., Cambridge, Mass., at 25c. Information as to preservation in alcohol or formalin will be sent to those who wish it.

Members collecting in Vermont or New Hampshire have cordial permission from Dr. Burt to send fungi to him for identification. He is particularly anxious to get notes, always accompanied by specimens, dried if necessary, of the occurrence of fungi in Vermont, for he is compiling a state list. His address is Middlebury, Vermont.

The Botanical Supply Co. have kindly given the Mycological Club for the present table and shelf room for herbarium work. Members in reach of Cambridge will find a visit to the Club Herbarium interesting, although the exhibit is at present small. With this can be combined a visit to the University Museum on Oxford St. where a fine representative exhibition of typical fungi and other cryptogamic plants is now being put in place on the first floor.

It has been suggested that much valuable photographic work can be done by members during the summer. The results could go towards a club collection, would give material for additional lantern-slides and possibly for a series of photogravures similar to those made by Mr. Lloyd of Cincinnati, if it should seem wise to embark on such an undertaking. The secretary would be glad to hear from those interested to do photographic work. If enough members reply, it will probably seem well to put the matter in the hands of a committee to systematize the work and prevent duplication.

FINANCES. These matters and others which suggest themselves point to ways of usefulness and activity as yet untried by the club as a

body. They also suggest additional demands on the Club treasury. There is besides a growing desire among the members for a Club headquarters, where the Herbarium could be kept together with a reference library, if the club ever has one, and where plants might be brought at certain times for identification and preservation. These considerations have induced the officers of the Club to make through the medium of this Bulletin an attempt to sound the wishes of the members in this matter. It is not proposed to increase the dues. But if it should seem wise to increase our expenses, the members who felt inclined would be asked to pledge themselves for perhaps three years to the annual payment of a certain sum. This plan is already in use in other clubs, and several members of the Mycological Club have expressed their eagerness to see it tried. If sufficient support of this suggestion comes through letters from the members, who are hereby invited to express their opinions, the necessary steps will be taken to put the plan in operation.

The Secretary, then, hopes to hear from members on the following matters: correct address; collection of herbarium specimens; photographic work; the subscription plan. His address is BOX 21, CAMBRIDGE MASS.

SACCARDO'S ARRANGEMENT.

In answer to requests for a standard systematic arrangement of the genera of the Hymenomycetes, it seems useful to supply members of the Club with an abridged adaptation of Saccardo's arrangement, drawn from the Sylloge Fungorum.

This synopsis can hardly serve as an analytical key to genera, nor is it intended to do so, but it may be useful as a compact survey of the most easily observed characters. It will be thoroughly intelligible only to those who familiarize themselves with the full exposition of generic characters to be found in such a work as Stevenson or Masee, and who further make a careful study of generic types from the plants themselves.

HYMENOMYCETAE.

Hymenium not an even surface, but	{	on radiating lamellae.	AGARICACEAE I.
		lining the interior of tubular pores.	
			POLYPORACEAE II
		covering needle shaped or other fleshy protuberances.	HYDNACEAE III.
Hymenium even, and	{	on lower surface; plant tough.	
			THELEPHORACEAE IV
		on all sides of the upper parts of erect fleshy clubs or dense branches; plant tender.	
			CLAVARIACEAE V.
		on outer surface of a gelatinous mass.	
			TREMELLACEAE VI

Fam. I. AGARICACEAE.

Gill-bearing mushrooms; divided into four groups according to the color of the spores.

- Group 1. *Leucosporae*, spores white or whitish, (in a few cases slightly tinted).
 - A. More or less fleshy, putrescent.
 - Amanita*. With volva and ring; gills usually free.

Amanitopsis. With volva; without ring; gills usually free.
Lepiota. Without volva; with ring; gills free.
Schulzeria. Without either volva or ring; gills free.
Armillaria. With ring; gills attached to stem.
Tricholoma. Ringless; fleshy; gills sinuate.
Clitocybe. Ringless; fleshy; gills decurrent.
Collybia. Cartilaginous stem; somewhat fleshy, margin of cap at first inrolled; gills not decurrent.
Mycena. Campanulate, rather delicate; margin at first straight; gills not decurrent.
Hiatula. Striate-plicate, diaphanous.
Omphalia. Umbilicate, fleshy membranaceous; gills decurrent.
Pleurotus. Stem excentric or wanting; growing on wood.
Hygrophorus. Gills waxy, variously attached, not easily divisible into two plates as in previous genera.
Lactarius. Juice milky; substance breaking into granules, spores rough with points.
Russula. Similar to the last, but with juiceless crumbling flesh and brittle gills.
Cantharellus. Gills thick and vein-like, or with edge obtuse, decurrent, branching, rather waxy.
Nyctalis. Gills rather thick, edge obtuse; on decaying fungi.

B. Fleshy-tough, or even corky, non-putrescent, reviving with moisture.

Marasmius. Gills not branched; cap firm, often thin and membranaceous, tough; stem slender, elastic.
Heliomyces. Similar to last, but gelatinous, though tough.
Lentinus. Gills with serrate edge; (cf. *Pleurotus* and *Panus*).
Panus. Gills entire, becoming tough, firmer than in the last; on wood.
Xerotus. Gills branched, edge obtuse.
Trogia. Gills like folds, channeled or crisp; stem wanting.
Lenzites. Corky; gills radiating, anastomosed, smooth; sessile, on trees, passing into polyporous forms.
Schizophyllum. Leathery; gills villous, with a split, doubly revolute edge; sessile.

Group 2. *Rhodosporae*. Spores rosy or rusty pink. No leathery species, all fleshy, putrescent.

Volvaria. With volva; no ring; gills free.
Annularia. With ring; no volva; gills free.
Pluteus. No volva; no ring; gills free.
Entoloma. Fleshy; margin of cap inrolled at first; gills sinuate.
Clitopilus. Fleshy; margin of cap inrolled at first; gills decurrent.
Leptonia. Stem cartilaginous; margin inflexed at first; gills slightly attached.
Nolanea. Stem cartilaginous; margin of cap always straight; gills slightly attached.
Eccilia. Stem cartilaginous; umbilicate; gills decurrent.
Claudopus. Stem excentric or none; on wood.

Group 3. *Ochrosporae*. Spores ochraceous or subferruginous.
 Species all fleshy, putrescent. [See *Bolbitius* in next group].

Pholiota. With ring; no volva; veil not arachnoid.
Acetabularia. With volva.

- Inocybe.** Fleshy; surface of cap fibrillose or silky; gills subsinuate.
- Hebeloma.** Fleshy; cap glabrous; viscid; gills subsinuate; spores somewhat argillaceous.
- Flammula.** Fleshy; gills adnate or decurrent.
- Naucoria.** Stem cartilaginous; margin of cap inflexed; gills not decurrent.
- Pluteolus.** Stem sub-cartilaginous; caps lightly fleshy, viscid, margin straight; gills not decurrent.
- Galera.** Stem sub-cartilaginous, (often fragile); cap membranaceous, striate, delicate, margin straight; gills not decurrent.
- Tubaria.** Stem cartilaginous; gills decurrent.
- Crepidotus.** Stem excentric or none; on wood.
- Cortinarius.** Fleshy; with a universal spider-web (arachnoid) veil, which usually disappears before maturity; gills soon ochraceous or brown with spores.
- Paxillus.** Gills easily separable from the hymenophorum; fleshy margin of pileus markedly and constantly inrolled.

Group 4. *Melanosporae*. Spores black, or approaching black, dark-brown, or (in *Bolbitius*) dark ferruginous. Species (except in one genus) soft, fleshy, putrescent.

A. Spores rather brown or purplish than black (*Pratellae*).

- Chitonia.** With volva.
- Agaricus.** With ring; no volva; gills free.
- Pilosace.** No volva; no ring; gills free.
- Stropharia.** With ring; no volva; gills adnate.
- Hypholoma.** Veil separating (usually) from the stem, and fringing for a time the margin of the expanding cap.
- Psilocybe.** Veil wanting or nearly so; margin of cap incurved when young; gills not decurrent.
- Deconica.** Veil and margin as in last; gills (triangular) decurrent.
- Psathyra.** Veil as in last; margin of cap always straight; gills not decurrent.
- Bolbitius.** Gills turning to mucus; cap membranaceous; spores fusco-ferruginous.

B. Spores black, or nearly so.

- Coprinus.** Cap membranaceous; gills turning to ink.
- Panaeolus.** Cap rather fleshy, not striate, margin extending a little beyond the mottled gills; no ring.
- Anellaria.** Cap as in last; with ring.
- Psathyrella.** Cap membranaceous, striate, not exceeding the smoky gills; stem somewhat cartilaginous.
- Gomphidius.** Gills mucilaginous, decurrent.
- Anthracophyllum.** Tough or horny, like a *Marasmius*.
- Montagnites.** Stem expanded at the top to form a disk to which the gills are attached.

Fam II. POLYPORACEAE.

- Boletus.** Fleshy, with central stem; tubules long, easily separable from the cap and from each other.
- Strobilomyces.** Differs from *Boletus* in that the stem is covered with

large loose scales, and that the longer, larger tubules are not easily separable from the cap.

Boletinus. Differs from *Boletus* in that the tubules are not easily separable from the cap; and from *Strobilomyces* in that there is apparent radiation in the arrangement of the pores.

Gyrodon. Tubules, as in the last two, not easily separable from the cap; but they are short and sinuous or with twisted folds.

Fistulina. Fleshy; stem wanting or lateral; tubules individually distinct.

Polyporus. Tubules in a distinct stratum, but not separable from the cap, preformed, not in successive layers; fleshy or tough (not woody), sessile, stipitate.

Fomes. Tubules as in the last, usually stratose (in successive layers); from the first woody, sessile.

Polystictus. Tubules as in *Polyporus*, but at first superficial, growing in length and distinctness, least developed near the margin of the cap; leathery or membranaceous.

Poria. Tubules as in *Polyporus* or *Polystictus*; resupinate, effused; no true pileus; waxy-leathery or membranaceous.

Trametes. Tubules sunk to unequal depths in substance of cap, not forming a distinct stratum, subcylindrical; corky, not stratose, sessile.

Daedalea. Tubules as in the last, but sinuous to labyrinthiform; corky, not stratose, sessile.

Cyclomyces. Tubules replaced wholly or in part by concentrically arranged lamellae; leathery, with or without a central stem.

Favolus. Pores alveolar, more or less radially disposed, fleshy-tough, stem usually lateral, not well developed.

Merulius. Pores shallow, irregular, formed by a mesh of fleshy radiating folds; resupinate, effused, waxy-membranaceous or gelatinous.

Porothelium. Tubules distinct, appearing first as papillae which rise separately from a mycelial mat, then elongate and tubular; resupinate, membranaceous.

Solenia. No true receptacle; tubules individually distinct, membranaceous, crowded, closed at first.

Fam. III. HYDNACEAE.

Hydnum. Fleshy or corky, sometimes resupinate, horizontal; teeth awl-shaped or needle-shaped, free, acute.

Hericium. Fleshy, clavate (cf. *Clavaria*), tips clothed with the spines.

Tremellodon. [See Tremellaceae].

Sistotrema. Fleshy or membranaceous; teeth discrete from the pileus, broadened into plates irregularly arranged.

Irpex. Leathery or woody; teeth concrete with the pileus, and connected at the base, regularly arranged, but not uniform in shape.

Radulum. Resupinate; with irregular, subcylindrical, obtuse tubercles.

Phlebia. Resupinate, fleshy; hymenium corrugated in crests, folds or ridges.

Grandinia. Resupinate; hymenium even, but rough with persistent granules.

Odontia. Resupinate, dry, woven of fibres; covered with granules that are finely multifid or crested.

Kneiffia. Resupinate, floccose; covered with minute stiff spines.

Mucronella. Pileus wanting; spines slender, pointed, vertical.

Fam IV. THELEPHORACEAE.

Craterellus. Fleshy or membranaceous, often funnel-shaped or cup-like.

Thelephora. Leathery, pileate or resupinate, hymenium even or nearly so, not cracked on drying.

Stereum. Leathery or woody, persistent; hymenium even, smooth, underlaid by an intermediate fibrous stratum.

Hymenochaete. Like the last; but the hymenium bears bristles.

Corticium. Resupinate, reflexed; hymenium somewhat waxy, with no intermediate layer, usually cracked when dry.

Peniophora. Leathery or somewhat fleshy; hymenium velvety with exserted, hyaline, cellular processes.

Coniophora. Membranaceous, resupinate; hymenium fleshy, pulverulent with minute colored spores.

Michenera. Resupinate, attached at the middle; hymenium waxy, covered with large, lemonshaped, stalked spores.

Hypochnus. Floccose-collapsing, or like a mould and resupinate; 4-spored basidia on long lax hyphae.

Exobasidium. Parasitic on living plants, waxy, often misshapen.

Cyphella. Sub-membranaceous, cup-shaped, often pendulous; hymenium typically concave or discoid.

Fam V. CLAVARIACEAE.

Sparassis. Fleshy, much branched; branches flattened, foliaceous, fertile on both sides.

Acurtis. Fibrous-fleshy, divided into clavate branches, which split; spores mealy.

Clavaria. Fleshy, branched or simple; branches typically rounded, smooth, not splitting.

Calocera. Cartilaginous-gelatinous, horny when dry, simple or branched.

Lachnocladium. Leathery, branched, tomentose.

Pterula. Coriaceous or cartilaginous, dry, simple or branched, filiform, compressed, glabrous, no distinct stem.

Typhula. Somewhat waxy, simple, club-shaped, filiform-stipitate.

Pistillaria. Waxy then horny, stiff, linear or somewhat club-shaped or sub-capitate; head stuffed, stem short or wanting.

Physalacria. Waxy-rigid, capitate; head sub-globose, hollow, thin-walled; stem slender, round, smooth, discrete.

Fam. VI. TREMELLACEAE.

Characterized by a gelatinous collapsing substance. Only a few of the genera are given here, for the distinctive characters, often microscopic, are hardly susceptible of brief systematic treatment.

Auricularia. Leathery, like *Stereum*; hymenium netted or ribbed.

Hirneola. Membranaceous, usually cup-shaped or ear-shaped; when dry, cartilaginous and almost diaphanous; hymenium even or plicate.

Exidia. Cup-shaped, truncate, or effuse, often papillose.

Tremella. Pulvinate or effuse, brain-like or mesenteriform.

Naematelia. Like the last, but with a hard fleshy nucleus.

Tremellodon. Like a *Hydnum*, but gelatinous.

Boston Mycological Club.

Bulletins Nos. 6 and 7.

(Issued, July, 1898).

DUES (\$1.00) FOR THE YEAR 1898-99 ARE PAYABLE any time after May 1st. Bills will not be sent, however, except to those who fail to regard this notice.

At the annual meeting held April 30th the following officers were elected: President, Dr. George E. Francis; Vice-president, William C. Bates; Secretary and Treasurer, Hollis Webster; Executive Committee (in addition to the officers) Dr. R. T. Dearborn, Miss M. C. Hallett, Mrs. F. A. Pierce, George B. Fessenden. Miss Helen M. Noyes has since been appointed to take charge of the exhibitions for the season, and to assist the secretary.

The secretary's report for 1897-98 called attention to the fact that at the last annual meeting it was voted that the financial year should begin on May 1st; that on that date members three months in arrears should be dropped; and that the fee of new members joining after February first should cover the dues of the year next succeeding.

The MEMBERSHIP of the Club increased from 200+ in 1897 to over 400 on April 30th, 1898. The exact membership at a given date can only be given approximately owing to unavoidable uncertainty as regards certain names on the list. It is proposed to publish annually a club book for which, the dues being so low, a small charge will perhaps be made.*

During the year five Bulletins were published, with a total of eighteen pages. A number of excursions were made. Exhibitions under the efficient charge of Miss Ellen W. Rumrill were held on every Saturday throughout the season from May until November, and in connection with these there were informal talks.

Meetings were held as follows for special discussion and lectures:

July 24th. Mushrooms and the Chafing-dish. Mrs. A. P. Doughty.

Oct. 16th. Cultivation of Mushrooms; discussion.

Dec. 18th. Methods of Drying and Preserving Edible Mushrooms; an extensive exhibition.

Dec. 22nd. Exhibition of sketches in color, of photographs, and of lantern slides.

March 9th, 23rd, and April 7th, three class lectures on Structure and Classification, illustrated by lantern, photographs, plates, and Herpel specimens, with notes on books of reference.

* All members who note any incorrectness in the address at present employed by the secretary are requested to write him at once, for the club list is soon to be printed. He would be glad to hear from every one without exception.

The Club during the year brought its collection of slides up to the number of two hundred.

In all these various ways the first and main purpose of the Club, that of education and guidance in the study of edible and poisonous fungi, was carried out.

The Treasurer's report showed that the receipts of the Club applicable to the year (\$376.00) were exceeded by the expenditures (\$388.00); the deficit being met out of the balance (\$48.00) on hand May 1st, 1897. In addition to this \$4.00 was received for arrears, and \$22.00 for dues paid in advance. From these data the actual paid up membership (about 400) is reckoned.

Since the formation of the Boston Mycological Club, other similar Clubs have been formed in Dedham, Mass.; in New York, N. Y.; in Washington, D. C., and in Philadelphia, Pa.

In Harper's Bazar for June 26th, 1897, was published an account of the "Westfield Toadstool Club" of Westfield, N. Y. organized on March 6th, 1895. This club antedates the B. M. C. by over five months. It is especially to be commended for choosing a title which is in actual correspondence with its objects and work. The B. M. C. so far has not proved its right to its more comprehensive name, but it is making a beginning to extend its field of work, as will be seen in the announcements and in the following note on the President's remarks at the annual meeting.

The President of the Club, Dr. Francis, reviewed the work of the year from the scientific side, and spoke of the need of more accurate and extended studies in regard to the season, habitat, and distribution of species that are familiar or that can be easily identified; also of the value of such data as can be gathered in regard to unfamiliar plants. The importance of such work he would insist on, not to the exclusion of the popular and more generally interesting purpose of the Club, but as a necessary adjunct and basis for that work, if it is to have value. Chief among our needs are: 1, a complete and accurate list of species already found in the country, or at least in the northeastern portion of it; 2, some expert authority to visit our exhibitions and deal in a final way with the specimens gathered.

Both of these desiderata are at present beyond our reach, but it is quite within our power to preserve notes and specimens in such form and condition that they may serve, when submitted to some competent authority, to enable the species to be determined. As a beginning, to make this part of the work more effective, the Executive Committee, to whom discretion in the matter was given, has deemed it wise to engage the services of a trained botanical student, to whom has been entrusted, in addition to the care of the exhibitions, the more important task of beginning collections for a herbarium.

ANNOUNCEMENTS.

A MEETING is called for Saturday, July 16th, at Horticultural Hall at 3 P. M. On Saturday, July 23rd, which is the first prize day for mushrooms, there will be an informal talk at 3 o'clock when the exhibition closes. Similar talks will frequently be given in connection with the regular weekly exhibitions.

Members are urged to interest themselves in the exhibitions and to bring in specimens. These should be at the hall before 10 A. M., and the exhibitor should place with every species his own name and a note of

the locality and habitat, All material should be carefully gathered, and brought in good condition.

EXCURSIONS. On Friday, July 15th, a party will leave the Union Station at 12.40 for Lynn Woods. Expense small.

Notices of other excursions will be published in the Boston Transcript in the southeast corner of the editorial page. The size of the Club makes individual notices too expensive. But the Secretary will send special word to any member who will send him an addressed card.

BULLETINS. Although the bulletins are delayed, the plan of issuing six has not been given up. A price of 50 cents has been fixed for the bulletins of 1897; nos. 2-5 can be supplied. Every member should have received a copy of Bull. No. 15, of the Division of Vegetable Physiology and Pathology, U. S. Dep't of Agriculture. Those who do not get it should send an individual personal request to the Department at Washington. The same advice may be given regarding Farmers' Bulletin No. 53. Of these the former contains an illustrated article by Dr. Farlow on "Some Edible and Poisonous Fungi," the latter is on "The Cultivation of Mushrooms."

A CLUB HERBARIUM. Under the care of Miss Noyes a nucleus for an herbarium has been formed, and a principal object of the year will be to add to this nucleus. The attempt will be made to preserve the interesting forms which appear at the exhibitions, particularly those whose determination is impossible or uncertain. Of these plants full notes will be kept. Exhibition specimens of typical forms will also be made for use at the winter lectures.

Those who feel that they can assist in this work and contribute to the Club Herbarium are requested to write to the secretary. Full directions for collection and preservation can be had nowhere better than in an article by Dr. Edward A. Burt in the Botanical Gazette for March of this year. A reprint of this is published by the Botanical Supply Co., Cambridge, Mass., at 25c. Information as to preservation in alcohol or formalin will be sent to those who wish it.

Members collecting in Vermont or New Hampshire have cordial permission from Dr. Burt to send fungi to him for identification. He is particularly anxious to get notes, always accompanied by specimens, dried if necessary, of the occurrence of fungi in Vermont, for he is compiling a state list. His address is Middlebury, Vermont.

The Botanical Supply Co. have kindly given the Mycological Club for the present table and shelf room for herbarium work. Members in reach of Cambridge will find a visit to the Club Herbarium interesting, although the exhibit is at present small. With this can be combined a visit to the University Museum on Oxford St. where a fine representative exhibition of typical fungi and other cryptogamic plants is now being put in place on the first floor.

It has been suggested that much valuable photographic work can be done by members during the summer. The results could go towards a club collection, would give material for additional lantern-slides and possibly for a series of photogravures similar to those made by Mr. Lloyd of Cincinnati, if it should seem wise to embark on such an undertaking. The secretary would be glad to hear from those interested to do photographic work. If enough members reply, it will probably seem well to put the matter in the hands of a committee to systematize the work and prevent duplication.

FINANCES. These matters and others which suggest themselves point to ways of usefulness and activity as yet untried by the club as a

body. They also suggest additional demands on the Club treasury. There is besides a growing desire among the members for a Club headquarters, where the Herbarium could be kept together with a reference library, if the club ever has one, and where plants might be brought at certain times for identification and preservation. These considerations have induced the officers of the Club to make through the medium of this Bulletin an attempt to sound the wishes of the members in this matter. It is not proposed to increase the dues. But if it should seem wise to increase our expenses, the members who felt inclined would be asked to pledge themselves for perhaps three years to the annual payment of a certain sum. This plan is already in use in other clubs, and several members of the Mycological Club have expressed their eagerness to see it tried. If sufficient support of this suggestion comes through letters from the members, who are hereby invited to express their opinions, the necessary steps will be taken to put the plan in operation.

The Secretary, then, hopes to hear from members on the following matters: correct address; collection of herbarium specimens; photographic work; the subscription plan. His address is BOX 21, CAMBRIDGE MASS.

SACCARDO'S ARRANGEMENT.

In answer to requests for a standard systematic arrangement of the genera of the Hymenomycetes, it seems useful to supply members of the Club with an abridged adaptation of Saccardo's arrangement, drawn from the Sylloge Fungorum.

This synopsis can hardly serve as an analytical key to genera, nor is it intended to do so, but it may be useful as a compact survey of the most easily observed characters. It will be thoroughly intelligible only to those who familiarize themselves with the full exposition of generic characters to be found in such a work as Stevenson or Masee, and who further make a careful study of generic types from the plants themselves.

HYMENOMYCETAE.

Hymenium not an even surface, but	{	on radiating lamellae.	AGARICACEAE I.
		lining the interior of tubular pores.	
			POLYPORACEAE II
	{	covering needle shaped or other fleshy protuberances.	HYDNACEAE III.
		on lower surface; plant tough.	
Hymenium even, and	{		THELEPHORACEAE IV
		on all sides of the upper parts of erect fleshy clubs or dense branches; plant tender.	
			CLAVARIACEAE V.
	{	on outer surface of a gelatinous mass.	
			TREMELLACEAE VI

Fam. I. AGARICACEAE.

Gill-bearing mushrooms; divided into four groups according to the color of the spores.

- Group 1. *Leucosporae*, spores white or whitish, (in a few cases slightly tinted).
 - A. More or less fleshy, putrescent.
 - Amanita*. With volva and ring; gills usually free.

Amanitopsis. With volva; without ring; gills usually free.

Lepiota. Without volva; with ring; gills free.

Schulzeria. Without either volva or ring; gills free.

Armillaria. With ring; gills attached to stem.

Tricholoma. Ringless; fleshy; gills sinuate.

Clitocybe. Ringless; fleshy; gills decurrent.

Collybia. Cartilaginous stem; somewhat fleshy, margin of cap at first inrolled; gills not decurrent.

Mycena. Campanulate, rather delicate; margin at first straight; gills not decurrent.

Hiatula. Striate-plicate, diaphanous.

Omphalia. Umbilicate, fleshy membranaceous; gills decurrent.

Pleurotus. Stem excentric or wanting; growing on wood.

Hygrophorus. Gills waxy, variously attached, not easily divisible into two plates as in previous genera.

Lactarius. Juice milky; substance breaking into granules, spores rough with points.

Russula. Similar to the last, but with juiceless crumbling flesh and brittle gills.

Cantharellus. Gills thick and vein-like, or with edge obtuse, decurrent, branching, rather waxy.

Nyctalis. Gills rather thick, edge obtuse; on decaying fungi.

B. Fleshy-tough, or even corky, non-putrescent, reviving with moisture.

Marasmius. Gills not branched; cap firm, often thin and membranaceous, tough; stem slender, elastic.

Heliomyces. Similar to last, but gelatinous, though tough.

Lentinus. Gills with serrate edge; (cf. *Pleurotus* and *Panus*).

Panus. Gills entire, becoming tough, firmer than in the last; on wood.

Xerotus. Gills branched, edge obtuse.

Trogia. Gills like folds, channeled or crisp; stem wanting.

Lenzites. Corky; gills radiating, anastomosed, smooth; sessile, on trees, passing into polyporous forms.

Schizophyllum. Leathery; gills villous, with a split, doubly revolute edge; sessile.

Group 2. *Rhodosporae*. Spores rosy or rusty pink. No leathery species, all fleshy, putrescent.

Volvaria. With volva; no ring; gills free.

Annularia. With ring; no volva; gills free.

Pluteus. No volva; no ring; gills free.

Entoloma. Fleshy; margin of cap inrolled at first; gills sinuate.

Clitopilus. Fleshy; margin of cap inrolled at first; gills decurrent.

Leptonia. Stem cartilaginous; margin inflexed at first; gills slightly attached.

Nolanea. Stem cartilaginous; margin of cap always straight; gills slightly attached.

Eccilia. Stem cartilaginous; umbilicate; gills decurrent.

Claudopus. Stem excentric or none; on wood.

Group 3. *Ochrosporae*. Spores ochraceous or subferruginous.

Species all fleshy, putrescent. [See *Bolbitius* in next group].

Pholiota. With ring; no volva; veil not arachnoid.

Acetabularia. With volva.

Inocybe. Fleishy; surface of cap fibrillose or silky; gills subsinuate.

Hebeloma. Fleishy; cap glabrous; viscid; gills subsinuate; spores somewhat argillaceous.

Flammula. Fleishy; gills adnate or decurrent.

Naucoria. Stem cartilaginous; margin of cap inflexed; gills not decurrent.

Pluteolus. Stem sub-cartilaginous; caps lightly fleishy, viscid, margin straight; gills not decurrent.

Galera. Stem sub-cartilaginous, (often fragile); cap membranaceous, striate, delicate, margin straight; gills not decurrent.

Tubaria. Stem cartilaginous; gills decurrent.

Crepidotus. Stem excentric or none; on wood.

Cortinarius. Fleishy; with a universal spider-web (arachnoid) veil, which usually disappears before maturity; gills soon ochraceous or brown with spores.

Paxillus. Gills easily separable from the hymenophorum; fleishy margin of pileus markedly and constantly inrolled.

Group 4. *Melanosporae.* Spores black, or approaching black, dark-brown, or (in *Bolbitius*) dark ferruginous. Species (except in one genus) soft, fleishy, putrescent.

A. Spores rather brown or purplish than black (*Pratellae*).

Chitonia. With volva.

Agaricus. With ring; no volva; gills free.

Pilosace. No volva; no ring; gills free.

Stropharia. With ring; no volva; gills adnate.

Hypholoma. Veil separating (usually) from the stem, and fringing for a time the margin of the expanding cap.

Psilocybe. Veil wanting or nearly so; margin of cap incurved when young; gills not decurrent.

Deconica. Veil and margin as in last; gills (triangular) decurrent.

Psathyra. Veil as in last; margin of cap always straight; gills not decurrent.

Bolbitius. Gills turning to mucus; cap membranaceous; spores fusco-ferruginous.

B. Spores black, or nearly so.

Coprinus. Cap membranaceous; gills turning to ink.

Panaeolus. Cap rather fleishy, not striate, margin extending a little beyond the mottled gills; no ring.

Anellaria. Cap as in last; with ring.

Psathyrella. Cap membranaceous, striate, not exceeding the smoky gills; stem somewhat cartilaginous.

Gomphidius. Gills mucilaginous, decurrent.

Anthracophyllum. Tough or horny, like a *Marasmius*.

Montagnites. Stem expanded at the top to form a disk to which the gills are attached.

Fam II. POLYPORACEAE.

Boletus. Fleishy, with central stem; tubules long, easily separable from the cap and from each other.

Strobilomyces. Differs from *Boletus* in that the stem is covered with

large loose scales, and that the longer, larger tubules are not easily separable from the cap.

Boletinus. Differs from *Boletus* in that the tubules are not easily separable from the cap; and from *Strobilomyces* in that there is apparent radiation in the arrangement of the pores.

Gyrodon. Tubules, as in the last two, not easily separable from the cap; but they are short and sinuous or with twisted folds.

Fistulina. Fleshy; stem wanting or lateral; tubules individually distinct.

Polyporus. Tubules in a distinct stratum, but not separable from the cap, preformed, not in successive layers; fleshy or tough (not woody), sessile, stipitate.

Fomes. Tubules as in the last, usually stratose (in successive layers); from the first woody, sessile.

Polystictus. Tubules as in *Polyporus*, but at first superficial, growing in length and distinctness, least developed near the margin of the cap; leathery or membranaceous.

Poria. Tubules as in *Polyporus* or *Polystictus*; resupinate, effused; no true pileus; waxy-leathery or membranaceous.

Trametes. Tubules sunk to unequal depths in substance of cap, not forming a distinct stratum, subcylindrical; corky, not stratose, sessile.

Daedalea. Tubules as in the last, but sinuous to labyrinthiform; corky, not stratose, sessile.

Cyclomyces. Tubules replaced wholly or in part by concentrically arranged lamellae; leathery, with or without a central stem.

Favolus. Pores alveolar, more or less radially disposed, fleshy-tough, stem usually lateral, not well developed.

Merulius. Pores shallow, irregular, formed by a mesh of fleshy radiating folds; resupinate, effused, waxy-membranaceous or gelatinous.

Porothelium. Tubules distinct, appearing first as papillae which rise separately from a mycelial mat, then elongate and tubular; resupinate, membranaceous.

Solenia. No true receptacle; tubules individually distinct, membranaceous, crowded, closed at first.

Fam. III. HYDNACEAE.

Hydnum. Fleshy or corky, sometimes resupinate, horizontal; teeth awl-shaped or needle-shaped, free, acute.

Hericium. Fleshy, clavate (cf. *Clavaria*), tips clothed with the spines.

Tremellodon. [See Tremellaceae].

Sistotrema. Fleshy or membranaceous; teeth discrete from the pileus, broadened into plates irregularly arranged.

Irpex. Leathery or woody; teeth concrete with the pileus, and connected at the base, regularly arranged, but not uniform in shape.

Radulum. Resupinate; with irregular, subcylindrical, obtuse tubercles.

Phlebia. Resupinate, fleshy; hymenium corrugated in crests, folds or ridges.

Grandinia. Resupinate; hymenium even, but rough with persistent granules.

Odontia. Resupinate, dry, woven of fibres; covered with granules that are finely multifid or crested.

Kneiffia. Resupinate, floccose; covered with minute stiff spines.

Mucronella. Pileus wanting; spines slender, pointed, vertical.

Fam IV. THELEPHORACEAE.

Craterellus. Fleshy or inembranaceous, often funnel-shaped or cup-like.

Thelephora. Leathery, pileate or resupinate, hymenium even or nearly so, not cracked on drying.

Stereum. Leathery or woody, persistent; hymenium even, smooth, underlaid by an intermediate fibrous stratum.

Hymenochaete. Like the last; but the hymenium bears bristles.

Corticium. Resupinate, reflexed; hymenium somewhat waxy, with no intermediate layer, usually cracked when dry.

Peniophora. Leathery or somewhat fleshy; hymenium velvety with exserted, hyaline, cellular processes.

Coniophora. Membranaceous, resupinate; hymenium fleshy, pulverulent with minute colored spores.

Michenera. Resupinate, attached at the middle; hymenium waxy, covered with large, lemonshaped, stalked spores.

Hypochnus. Floccose-collapsing, or like a mould and resupinate; 4-spored basidia on long lax hyphae.

Exobasidium. Parasitic on living plants, waxy, often misshapen.

Cyphella. Sub-membranaceous, cup-shaped, often pendulous; hymenium typically concave or discoid.

Fam V. CLAVARIACEAE.

Sparassis. Fleshy, much branched; branches flattened, foliaceous, fertile on both sides.

Acurtis. Fibrous-fleshy, divided into clavate branches, which split; spores mealy.

Clavaria. Fleshy, branched or simple; branches typically rounded, smooth, not splitting.

Calocera. Cartilaginous-gelatinous, horny when dry, simple or branched.

Lachnocladium. Leathery, branched, tomentose.

Pterula. Coriaceous or cartilaginous, dry, simple or branched, filiform, compressed, glabrous, no distinct stem.

Typhula. Somewhat waxy, simple, club-shaped, filiform-stipitate.

Pistillaria. Waxy then horny, stiff, linear or somewhat club-shaped or sub-capitate; head stuffed, stem short or wanting.

Physalacria. Waxy-rigid, capitate; head sub-globose, hollow walled; stem slender, round, smooth, discrete.

Fam. VI. TREMELLACEAE.

Characterized by a gelatinous collapsing substance. Only a few of the genera are given here, for the distinctive characters, often microscopic, are hardly susceptible of brief systematic treatment.

Auricularia. Leathery, like *Stereum*; hymenium netted or ribbed.

Hirneola. Membranaceous, usually cup-shaped or ear-shaped; when dry, cartilaginous and almost diaphanous; hymenium even or plicate.

Exidia. Cup-shaped, truncate, or effuse, often papillose.

Tremella. Pulvinate or effuse, brain-like or mesenteriform.

Naematelia. Like the last, but with a hard fleshy nucleus.

Tremellodon. Like a *Hydnum*, but gelatinous.

Boston Mycological Club.

Bulletin No. 8. (Issued, November, 1898).

HOLLIS WEBSTER, Sec'y and Treas., P. O. Box 21, Cambridge, Mass.

NOTICES. The second monthly evening meeting for 1898-99 will be held on Monday, Nov. 14th, at 7.45 P. M., at the rooms of the Boston Society of Natural History. It is hoped that members will provide a supply of fresh fungi as a basis for discussion. If time permits there will be a short talk on the genus *Pleurotus* with special reference to certain noteworthy species. Members are urged particularly to bring specimens of *Pleurotus ulmarius*, *P. sapidus*, *P. ostreatus*, *P. serotinus*, *P. porrigens*, and *P.* (now *Claudopus*) *nidulans*, all of which may possibly be found on stumps or trees in a growing state even as late in the season as this. Contributors should be ready with notes as to habitat (kind of tree) etc., and should try to procure specimens which illustrate the variability of each species. Spore prints, dried specimens, sketches, and photographs of *Pleurotus* will also be of use. Some plates will be shown.

REGULAR MEETINGS will be held at the same hour and place on the SECOND MONDAY of each month until further notice.

DUES and MEMBERSHIP CARDS. In accordance with a vote passed July 16th last, with this bulletin are distributed cards of membership equivalent to a receipt for dues for the current year, which will end May 1st, 1899. Some members already have their cards. Others who fail to receive them with this bulletin, and who find a mark against this notice will understand that their dues for the current year remain unpaid and are requested to send \$1.00 to the Treasurer. By the vote just mentioned no more bulletins (there will be three more) will be sent to delinquents in the matter of dues.

THE SUBSCRIPTION FUND. The response to the recent circular of the Executive Committee requesting additional funds to enable the club to extend its work has been generous from a number of members. The total amount so far is \$97.00 of which \$87.00 has been paid. Of this amount, however, \$28.00 is in the form of a gift, leaving \$69.00 as the sum actually pledged for three years by twenty-two members. The thanks of the club are due to these members and to the three who have given the sum above mentioned.

For the benefit of those who have joined since the circular was sent out, as well as for those others, no doubt many, who will yet subscribe, a few words are in order as to the use of this fund.

It is primarily to meet in this and the next two years the expense of rental for club meetings, of the herbarium work, and of an assistant for the Secretary. As was shown by the Treasurer's report, last year's receipts were not quite sufficient to meet the expenses, the deficit being made good from the surplus of the year before. An estimate of the larger items of expense for the current year will show that the dues will not amount to enough to allow the work of the club to be enlarged: for printing and postage, \$200.00; herbarium expenses, 75.00; assistant, 125.00; expenses of exhibitions, 30.00; rental, 60.00. Allowance for miscellaneous expenses would carry this estimate well above \$500.00, and it is not yet certain that the paid up membership will nearly approach that sum. No charge is here included for the present quarters of the herbarium, which is now dependent on the hospitality of the Cambridge Botanical Supply Co.

The collection, as it grows, will need to be suitably housed, in order that it may be of use for consultation. When the Club has quarters of

its own, it will be possible to have a modest reference library and a collection of sketches and photographs, access to which cannot fail to be of the greatest assistance to all. It may besides be possible to have the rooms open on certain days in the week—on Monday for instance—with some one in charge to assist in the determination of plants brought in. If with this could be combined the herbarium work, the Club would enter upon a greatly enlarged field of usefulness. The realization of a plan of this kind demands money, and unless the annual dues are to be raised, which seems hardly advisable, or the membership is to be increased many fold, which is desirable and probable in time, the funds of the Club must depend on individual subscription. Perhaps each member knows a friend to whom the advantages of membership in the Club can be easily demonstrated. Every member should be glad to see the Club start out next spring with quarters, however modest, of its own.

A NEW MONTHLY. The Mycological Club is not alone in its desire to make the Fleshy Fungi better known. As already announced in a circular distributed some months ago, a new botanical monthly to be devoted to the Flora of New England will begin to appear in January next. This is the Journal of the New England Botanical Club, to be edited by Dr. B. L. Robinson of the Gray Herbarium assisted by Mr. F. S. Collins, Mr. M. L. Fernald, and Mr. Hollis Webster. Several pages out of the sixteen or twenty of each number will be devoted to the Fleshy Fungi. Among the subscribers are a goodly number of members of the Mycological Club, but additional subscriptions will be gladly received. They may be sent to the Secretary, Box 21, Cambridge. The price is \$1.00 a year, payable in January next.

BULLETINS. Attention is called to the note under this head in the last number. Club Bulletins 3, 4, and 5 can be supplied at a cost of 50c for the three.

A CLUB BOOK. The Club list is in the printer's hands. Correction of addresses should be made at once if they are to be in time.

COPIES OF MR. LLOYD'S PAPER on the "Volvae of the United States" are to be sent by the generosity of the author to every member of the Club. The paper is a most helpful compilation of descriptions, with brief notes, of all the Agarics with the structure of Amanita yet found in the country. It is perhaps needless to suggest that a personal acknowledgment will be due Mr. Lloyd from each recipient of his courtesy.

PLEUROTUS.

The genus is separated from others with white spores by the excentricity or absence of stem. The species are fleshy, not at all cartilaginous, on trees or stumps, either sessile or with a stem which may be truly lateral or only excentric, and whose length often varies with the circumstances of growth. A few have a fugacious veil. The gills are variously attached, sometimes long decurrent. The size of the plants varies from 6 to 10 in. (Nos. 1, 10, 11) to $\frac{1}{4}$ in., more or less (Nos. 26-29). (See, for synopsis of New York species by Prof. C. H. Peck, the 39th Report of the N. Y. State Museum, for 1885.)

Stem excentric, but pileus entire, though sometimes reduced to a thin, narrow margin on one side. a. Lamellae not decurrent. Nos. 1-5.

1. *P. ulmarius* Fr. Compact, heavy, sometimes very large, glabrous, whitish or pale brownish, sometimes spotted, shiny when old, surface sometimes cracked. Stem often nearly central, thick, solid, sometimes tomentose. Gills rather close, broad, adnexed. Common on elm and other trees in late autumn; variable. E. (Known to be edible.)

2. *P. sub-palmatus* Fr. Soft, reddish, wrinkled and gelatinous on top; flesh variegated much as in *Fistulina hepatica*; gills dingy, joined behind. Old trunks, etc., caespitose, rare.

3. *P. craspedius* Fr. Soft, becoming tough, reddish to pale brown or ashen, margin wavy and crenately lobed; stem solid, glabrous, pallid; gills close, white. Cæspitose, on trunks in woods, rare.

4. *P. sulphureoides* Peck. Fleshy, rather thin, umbonate, pale yellow, sometimes squamulose; gills rather broad, slightly rounded behind or emarginate, pale yellow; stem fibrillose, stuffed or hollow, slightly mealy at the top, yellowish or pallid. Prostrate trunks, rare.

5. *P. liguatilis* Fr. Fleshy, thin, tough, often umbilicate, mealy or glabrous, white; gills narrow, crowded, white; stem unequal, rather slender, somewhat tomentose, stuffed then hollow; smells of meal. On decaying wood, etc. Common and variable.

b. *Lamellae decurrent.* Nos. 6-13.

Nos. 6 and 7 have a veil.

6. *P. corticatus* Fr. With a veil which tears into membranous shreds attached to the margin of the cap (appendiculate), or forms a ring which soon vanishes; pileus compact, thick, densely villous, or floccose, entire; gills long decurrent, forked, anastomosing below; stem firm, rooting, fibrillose; plant white, sometimes very large. On trunks, rare, not unlike the next.

7. *P. dryinus* Pers. Veil lacerate, appendiculate; pileus thick, hard, thin at the edges, variegated with dark scales; gills decurrent, almost simple, not anastomosing, white, bruising yellow; stem thick, whitish. Oak, ash, apple etc., rare. E.

8. *P. subareolatus* Peck. Compact, whitish, tinged with brownish pink, surface cracking into small spots; gills rather broad, loose, decurrent, whitish, tinged when dry with yellow; stem short, firm, solid, white. On elm, rare.

9. *P. pometi* Fr. Fleshy, somewhat flaccid, centre depressed, glabrous, even, white; stem solid, elastic, radicating and villous at the base; gills decurrent, crowded, broad, distinct below, white. Apple trees, etc. E.

10. *P. sapidus* Kalchbr. Large, fleshy, generally cæspitose, glabrous, variable in color; gills rather broad and distant, sometimes anastomosing at the decurrent base; stem firm solid, often very short, whitish. Common, very variable, usually taken for the next, but the spores are *pale lilac*, not white. E.

11. *P. ostreatus* Fr. Much like the last, but the gills are said always to anastomose below; the stem is very short and sometimes wanting, and often hairy at the base, and the spores are white; smell and taste rather strong. The Oyster Mushroom; common. E.

var. glandulosus is brown, and has wart-like bodies on the gills.

12. *P. euosmus* Berk. Has a strong pleasant smell, is white and shining with a tinge of blue, and the pilei are much crowded; the spores are not white, but as in *P. sapidus*.

13. *P. salignus* Fr. Fleshy, firm, spongy, nearly dimidiate as in the following species, depressed and often hairy behind, whitish or darker; gills sparingly branched, decurrent, distinct at the base, eroded on the edge, crowded, dingy; stem very short or wanting, lateral, tomentose; spores become dingy. On willows, etc.; taste slightly acid.

Dimidiate, pileus developed only on one side of the stem, which is thus definitely lateral, or is wanting entirely, leaving the plant sessile. Not at first resupinate. Nos. 14-18.

14. *P. serotinus* Fr. Fleshy, compact, viscid when young or moist, often imbricated, color varying, but often brown with yellowish and greenish tints, margin at first involute; gills close, determinate, whitish, or yellowish; stem very short, yellowish, and minutely blackish tomentose. Dead trunks, etc. Common.

15. *P. mitis* Fr. Small, tough, kidney-shaped, glabrous, pallid; gills crowded, determinate; stem dilated above, white-squamulose. Resembles *Panus stipticus*. Rare.

16. *P. tremulus* Fr. Very small, thin, tenacious, glabrous, livid-gray or grayish brown; gills linear, subdistant, gray or grayish; stem short, ascending, villose at the base. Among or attached to mosses. Rare.

17. *P. petaloides* Fr. Rather thin, small, wedge-shaped or spatulate, tapering into the short tomentose stem, sometimes grayish pubescent toward the base, whitish to brownish; gills crowded, linear, decurrent, whitish or yellowish; spores minute, globose. Decaying wood.

18. *P. spathulatus* (var. of the last? Fr.) Peck. Much like the last but more variable in color, and the spores are elliptical and larger. On the ground, often in tufts. E.

Pileus at first resupinate (i. e. on its back, gills up), then reflexed, stemless; gills radiating from an excentric point. Nos. 19–29.

19. *P. porrigens* Fr. Rather thin, suborbicular, then prolonged, often longer than broad, pure white, glabrous, or tomentose near the base, margin sometimes lobed; gills narrow, thin, linear, crowded, sometimes forked or anastomosing at the base. Decayed pine and hemlock wood. Common.

20. *P. pinsitus* Fr. Fleshy, soft, hygrophanous, sessile, silky-villous, wavy, sordid when wet, pure white when dry; gills broad, distinct. Spores sordid. Tree trunks, rare.

21. *P. nidulans* (Pers.) Fr. Not large, sessile, or rarely with a narrowed base, tomentose, hairy toward the margin, yellow or buff, margin at first involute; gills rather broad, not close, orange-yellow; spores a delicate pink. By some placed under *Claudopus* because of the color of the spores. A striking plant, not uncommon on decaying wood.

22. *P. septicus* Fr. White throughout, very small, thin, pubescent or powdery, sessile or nearly so; gills rather broad, subdistant. Decaying wood.

23. *P. mastrucatus* Fr. Viscid, fleshy, upper stratum gelatinous, imbricated, sessile, lobed, scaly, mouse-gray, rough, somewhat hairy; gills broad, rather distant, whitish gray. Fallen trunks in woods. Rare.

24. *P. atrocaeruleus* Fr. Viscid, fleshy, upper stratum gelatinous, variously shaped, rather tough, imbricated, sessile, villose-tomentose, dark blue, blackish, or brownish; gills rather broad, whitish or yellowish. Decaying trunks of poplar, beech etc. Rare.

25. *P. algidus* Fr. Viscid, fleshy, small, cuticle thin, glabrous, reddish brown or ashen; gills rather broad, close, yellowish. Rotten wood.

26. *P. atropellitus* Peck. Very small and thin, rather tough and flaccid, villose-tomentose, except on the margin, sessile or with a short grayish tomentose stem, blackish brown or black; gills rather broad, close, blackish brown or black, whitish on the edge. Decaying wood and bark; closely related to the next.

27. *P. applicatus* Batsch. Very small ($\frac{1}{4}$ in.), dark cinereous, submembranaceous, rather firm, villose at the base, sessile, or with a prolongation at the back, cupular; gills distant, paler than the pileus. Color variable. On rotten wood.

28. *P. niger* Schw. Very small, submembranaceous, somewhat resupinate, powdery, plicate on the margin, attached by a tuft of black hairs; gills broad, radiating, black, cinereous on the edge. Much like the next. Rare.

29. *P. striatulus* Fr. Very small, membranous, delicate, sometimes obconic and pendulous, sessile, slightly striate when moist, strongly so when dry, flaccid, glabrous, persistent, cinereous or brown; gills few, distant, whitish or cinereous. Decayed pine and hemlock.

Boston Mycological Club.

Bulletin No. 8. (Issued, November, 1898).

HOLLIS WEBSTER, Sec'y and Treas., P. O. Box 21, Cambridge, Mass.

NOTICES. The second monthly evening meeting for 1898-99 will be held on Monday, Nov. 14th, at 7.45 P. M., at the rooms of the Boston Society of Natural History. It is hoped that members will provide a supply of fresh fungi as a basis for discussion. If time permits there will be a short talk on the genus *Pleurotus* with special reference to certain noteworthy species. Members are urged particularly to bring specimens of *Pleurotus ulmarius*, *P. sapidus*, *P. ostreatus*, *P. serotinus*, *P. porrigens*, and *P.* (now *Claudopus*) *nidulans*, all of which may possibly be found on stumps or trees in a growing state even as late in the season as this. Contributors should be ready with notes as to habitat (kind of tree) etc., and should try to procure specimens which illustrate the variability of each species. Spore prints, dried specimens, sketches, and photographs of *Pleurotus* will also be of use. Some plates will be shown.

REGULAR MEETINGS will be held at the same hour and place on the SECOND MONDAY of each month until further notice.

DUES and MEMBERSHIP CARDS. In accordance with a vote passed July 16th last, with this bulletin are distributed cards of membership equivalent to a receipt for dues for the current year, which will end May 1st, 1899. Some members already have their cards. Others who fail to receive them with this bulletin, and who find a mark against this notice will understand that their dues for the current year remain unpaid and are requested to send \$1.00 to the Treasurer. By the vote just mentioned no more bulletins (there will be three more) will be sent to delinquents in the matter of dues.

THE SUBSCRIPTION FUND. The response to the recent circular of the Executive Committee requesting additional funds to enable the club to extend its work has been generous from a number of members. The total amount so far is \$97.00 of which \$87.00 has been paid. Of this amount, however, \$28.00 is in the form of a gift, leaving \$69.00 as the sum actually pledged for three years by twenty-two members. The thanks of the club are due to these members and to the three who have given the sum above mentioned.

For the benefit of those who have joined since the circular was sent out, as well as for those others, no doubt many, who will yet subscribe, a few words are in order as to the use of this fund.

It is primarily to meet in this and the next two years the expense of rental for club meetings, of the herbarium work, and of an assistant for the Secretary. As was shown by the Treasurer's report, last year's receipts were not quite sufficient to meet the expenses, the deficit being made good from the surplus of the year before. An estimate of the larger items of expense for the current year will show that the dues will not amount to enough to allow the work of the club to be enlarged: for printing and postage, \$200.00; herbarium expenses, 75.00; assistant, 125.00; expenses of exhibitions, 30.00; rental, 60.00. Allowance for miscellaneous expenses would carry this estimate well above \$500.00, and it is not yet certain that the paid up membership will nearly approach that sum. No charge is here included for the present quarters of the herbarium, which is now dependent on the hospitality of the Cambridge Botanical Supply Co.

The collection, as it grows, will need to be suitably housed, in order that it may be of use for consultation. When the Club has quarters of

its own, it will be possible to have a modest reference library and a collection of sketches and photographs, access to which cannot fail to be of the greatest assistance to all. It may besides be possible to have the rooms open on certain days in the week—on Monday for instance—with some one in charge to assist in the determination of plants brought in. If with this could be combined the herbarium work, the Club would enter upon a greatly enlarged field of usefulness. The realization of a plan of this kind demands money, and unless the annual dues are to be raised, which seems hardly advisable, or the membership is to be increased many fold, which is desirable and probable in time, the funds of the Club must depend on individual subscription. Perhaps each member knows a friend to whom the advantages of membership in the Club can be easily demonstrated. Every member should be glad to see the Club start out next spring with quarters, however modest, of its own.

A NEW MONTHLY. The Mycological Club is not alone in its desire to make the Fleshy Fungi better known. As already announced in a circular distributed some months ago, a new botanical monthly to be devoted to the Flora of New England will begin to appear in January next. This is the Journal of the New England Botanical Club, to be edited by Dr. B. L. Robinson of the Gray Herbarium assisted by Mr. F. S. Collins, Mr. M. L. Fernald, and Mr. Hollis Webster. Several pages out of the sixteen or twenty of each number will be devoted to the Fleshy Fungi. Among the subscribers are a goodly number of members of the Mycological Club, but additional subscriptions will be gladly received. They may be sent to the Secretary, Box 21, Cambridge. The price is \$1.00 a year, payable in January next.

BULLETINS. Attention is called to the note under this head in the last number. Club Bulletins 3, 4, and 5 can be supplied at a cost of 50c for the three.

A CLUB BOOK. The Club list is in the printer's hands. Correction of addresses should be made at once if they are to be in time.

COPIES OF MR. LLOYD'S PAPER on the "Volvae of the United States" are to be sent by the generosity of the author to every member of the Club. The paper is a most helpful compilation of descriptions, with brief notes, of all the Agarics with the structure of *Amanita* yet found in the country. It is perhaps needless to suggest that a personal acknowledgment will be due Mr. Lloyd from each recipient of his courtesy.

PLEUROTUS.

The genus is separated from others with white spores by the excentricity or absence of stem. The species are fleshy, not at all cartilaginous, on trees or stumps, either sessile or with a stem which may be truly lateral or only excentric, and whose length often varies with the circumstances of growth. A few have a fugacious veil. The gills are variously attached, sometimes long decurrent. The size of the plants varies from 6 to 10 in. (Nos. 1, 10, 11) to $\frac{1}{4}$ in., more or less (Nos. 26-29). (See, for synopsis of New York species by Prof. C. H. Peck, the 39th Report of the N. Y. State Museum, for 1885.)

Stem excentric, but pileus entire, though sometimes reduced to a thin, narrow margin on one side. a. Lamellae not decurrent. Nos. 1-5.

1. *P. ulmarius* Fr. Compact, heavy, sometimes very large, glabrous, whitish or pale brownish, sometimes spotted, shiny when old, surface sometimes cracked. Stem often nearly central, thick, solid, sometimes tomentose. Gills rather close, broad, adnexed. Common on elm and other trees in late autumn; variable. E. (Known to be edible.)

2. *P. sub-palmatus* Fr. Soft, reddish, wrinkled and gelatinous on top; flesh variegated much as in *Fistulina hepatica*; gills dingy, joined behind. Old trunks, etc., caespitose, rare.

3. *P. craspedius* Fr. Soft, becoming tough, reddish to pale brown or ashen, margin wavy and crenately lobed; stem solid, glabrous, pallid; gills close, white. Cæspitose, on trunks in woods, rare.

4. *P. sulphureoides* Peck. Fleshy, rather thin, umbonate, pale yellow, sometimes squamulose; gills rather broad, slightly rounded behind or emarginate, pale yellow; stem fibrillose, stuffed or hollow, slightly mealy at the top, yellowish or pallid. Prostrate trunks, rare.

5. *P. lignatilis* Fr. Fleshy, thin, tough, often umbilicate, mealy or glabrous, white; gills narrow, crowded, white; stem unequal, rather slender, somewhat tomentose, stuffed then hollow; smells of meal. On decaying wood, etc. Common and variable.

b. *Lamellae decurrent.* Nos. 6-13.

Nos. 6 and 7 have a veil.

6. *P. corticatus* Fr. With a veil which tears into membranous shreds attached to the margin of the cap (appendiculate), or forms a ring which soon vanishes; pileus compact, thick, densely villous, or floccose, entire; gills long decurrent, forked, anastomosing below; stem firm, rooting, fibrillose; plant white, sometimes very large. On trunks, rare, not unlike the next.

7. *P. dryinus* Pers. Veil lacerate, appendiculate; pileus thick, hard, thin at the edges, variegated with dark scales; gills decurrent, almost simple, not anastomosing, white, bruising yellow; stem thick, whitish. Oak, ash, apple etc., rare. E.

8. *P. subareolatus* Peck. Compact, whitish, tinged with brownish pink, surface cracking into small spots; gills rather broad, loose, decurrent, whitish, tinged when dry with yellow; stem short, firm, solid, white. On elm, rare.

9. *P. pometi* Fr. Fleshy, somewhat flaccid, centre depressed, glabrous, even, white; stem solid, elastic, radicating and villous at the base; gills decurrent, crowded, broad, distinct below, white. Apple trees, etc. E.

10. *P. sapidus* Kalchbr. Large, fleshy, generally cæspitose, glabrous, variable in color; gills rather broad and distant, sometimes anastomosing at the decurrent base; stem firm solid, often very short, whitish. Common, very variable, usually taken for the next, but the spores are *pale lilac*, not white. E.

11. *P. ostreatus* Fr. Much like the last, but the gills are said always to anastomose below; the stem is very short and sometimes wanting, and often hairy at the base, and the spores are white; smell and taste rather strong. The Oyster Mushroom; common. E.

var. glandulosus is brown, and has wart-like bodies on the gills.

12. *P. euosmus* Berk. Has a strong pleasant smell, is white and shining with a tinge of blue, and the pilei are much crowded; the spores are not white, but as in *P. sapidus*.

13. *P. salignus* Fr. Fleshy, firm, spongy, nearly dimidiate as in the following species, depressed and often hairy behind, whitish or darker; gills sparingly branched, decurrent, distinct at the base, eroded on the edge, crowded, dingy; stem very short or wanting, lateral, tomentose; spores become dingy. On willows, etc.; taste slightly acid.

Dimidiate, pileus developed only on one side of the stem, which is thus definitely lateral, or is wanting entirely, leaving the plant sessile. Not at first resupinate. Nos. 14-18.

14. *P. serotinus* Fr. Fleshy, compact, viscid when young or moist, often imbricated, color varying, but often brown with yellowish and greenish tints, margin at first involute; gills close, determinate, whitish, or yellowish; stem very short, yellowish, and minutely blackish tomentose. Dead trunks, etc. Common.

15. *P. mitis* Fr. Small, tough, kidney-shaped, glabrous, pallid; gills crowded, determinate; stem dilated above, white-squamulose. Resembles *Panus stipticus*. Rare.

16. *P. tremulus* Fr. Very small, thin, tenacious, glabrous, livid-gray or grayish brown; gills linear, subdistant, gray or grayish; stem short, ascending, villose at the base. Among or attached to mosses. Rare.

17. *P. petaloides* Fr. Rather thin, small, wedge-shaped or spatulate, tapering into the short tomentose stem, sometimes grayish pubescent toward the base, whitish to brownish; gills crowded, linear, decurrent, whitish or yellowish; spores minute, globose. Decaying wood.

18. *P. spathulatus* (var. of the last? Fr.) Peck. Much like the last but more variable in color, and the spores are elliptical and larger. On the ground, often in tufts. E.

Pileus at first resupinate (i. e. on its back, gills up), then reflexed, stemless; gills radiating from an excentric point. Nos. 19-29.

19. *P. porrigens* Fr. Rather thin, suborbicular, then prolonged, often longer than broad, pure white, glabrous, or tomentose near the base, margin sometimes lobed; gills narrow, thin, linear, crowded, sometimes forked or anastomosing at the base. Decayed pine and hemlock wood. Common.

20. *P. pinsitus* Fr. Fleshy, soft, hygrophanous, sessile, silky-villous, wavy, sordid when wet, pure white when dry; gills broad, distinct. Spores sordid. Tree trunks, rare.

21. *P. nidulans* (Pers.) Fr. Not large, sessile, or rarely with a narrowed base, tomentose, hairy toward the margin, yellow or buff, margin at first involute; gills rather broad, not close, orange-yellow; spores a delicate pink. By some placed under *Claudopus* because of the color of the spores. A striking plant, not uncommon on decaying wood.

22. *P. septicus* Fr. White throughout, very small, thin, pubescent or powdery, sessile or nearly so; gills rather broad, subdistant. Decaying wood.

23. *P. mastrucatus* Fr. Viscid, fleshy, upper stratum gelatinous, imbricated, sessile, lobed, scaly, mouse-gray, rough, somewhat hairy; gills broad, rather distant, whitish gray. Fallen trunks in woods. Rare.

24. *P. atrocaeruleus* Fr. Viscid, fleshy, upper stratum gelatinous, variously shaped, rather tough, imbricated, sessile, villose-tomentose, dark blue, blackish, or brownish; gills rather broad, whitish or yellowish. Decaying trunks of poplar, beech etc. Rare.

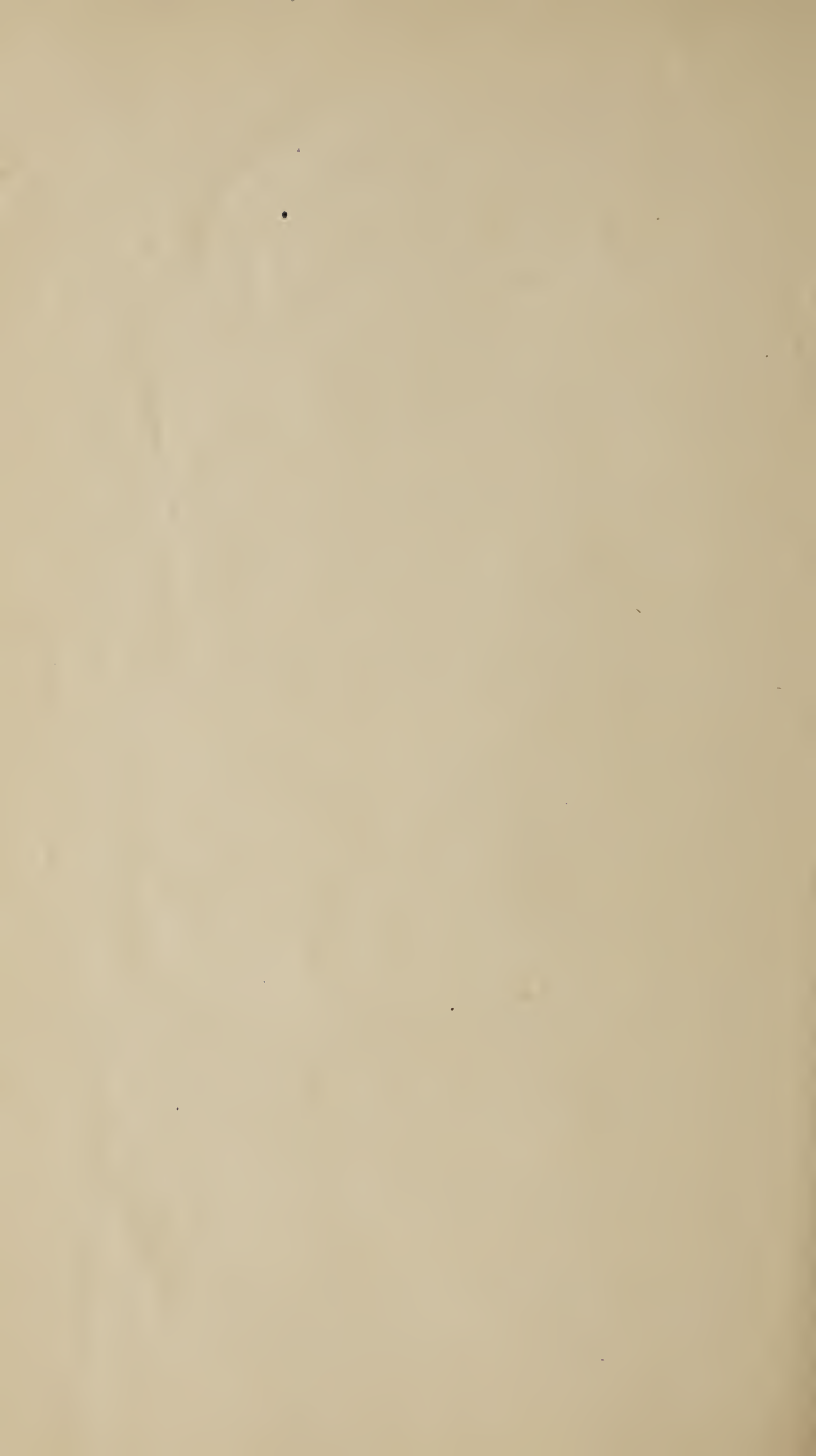
25. *P. algidus* Fr. Viscid, fleshy, small, cuticle thin, glabrous, reddish brown or ashen; gills rather broad, close, yellowish. Rotten wood.

26. *P. atropellitus* Peck. Very small and thin, rather tough and flaccid, villose-tomentose, except on the margin, sessile or with a short grayish tomentose stem, blackish brown or black; gills rather broad, close, blackish brown or black, whitish on the edge. Decaying wood and bark; closely related to the next.

27. *P. applicatus* Batsch. Very small ($\frac{1}{4}$ in.), dark cinereous, submembranaceous, rather firm, villose at the base, sessile, or with a prolongation at the back, cupular; gills distant, paler than the pileus. Color variable. On rotten wood.

28. *P. niger* Schw. Very small, submembranaceous, somewhat resupinate, powdery, plicate on the margin, attached by a tuft of black hairs; gills broad, radiating, black, cinereous on the edge. Much like the next. Rare.

29. *P. striatulus* Fr. Very small, membranous, delicate, sometimes obconic and pendulous, sessile, slightly striate when moist, strongly so when dry, flaccid, glabrous, persistent, cinereous or brown; gills few, distant, whitish or cinereous. Decayed pine and hemlock.



Boston Mycological Club.

BULLETIN NO. 9.

[Issued June, 1899, as a reprint, by permission, from *Rhodora*, Vol. 1, No. 4,
for April, 1899.]

A LIST OF VERMONT HELVELLEAE, WITH DESCRIPTIVE NOTES.¹

E. A. BURT.

(Plate 4.)

THE Helvelleae are a family of discomycetous fungi with fructifications consisting usually of two portions; an ascigerous, or spore-containing portion and a stem — sometimes called stipe — upon which the ascigerous portion is elevated above the underground, vegetative mycelium. The ascigerous portion (*a*, figs. 3 and 4) is very varied in form, as mitrate, clavate, capitate, ovoid, etc. The reproduction of the Helvelleae is by ascospores, that is by spores contained in the interior of fleshy sacs, called asci. From two to eight spores, according to the species, are contained in an ascus (figs. 1*a*, 4*b*, etc.). The asci, intermixed with sterile, thread-like bodies, called paraphyses (figs. 4*c* and 5*a*) are arranged side by side in a palisade layer, called the hymenium, which forms the outer and upper surface of the ascigerous portion. The hymenial surface is either even, rugose, gyrose-convolute or pitted by intersecting systems of ridges, its configuration affording in some cases characters of generic value.

By their habit and size, some species of the Helvelleae may be confused with Basidiomycetes, such as Phalleae, Sparassis, and the simple club-like forms of Clavaria. Microscopic examination with a one-fifth or one-sixth-inch objective of a small bit of the hymenium, crushed down in a drop of water under a cover glass, will decide all doubtful cases by showing the characteristic asci containing spores for all Helvelleae.

Some species of Xylaria, a genus of pyrenomycetous fungi, have fructifications which somewhat resemble those of Geoglossum, a genus

¹ Read in abstract before the Vermont Botanical Club, January 28, 1899.

of the Helvelleae. The species of *Xylaria* are more woody when mature, however, and sectional views of their fructifications show the hymenium, lining small sunken pits, the perithecia, each of which opens to the exterior by only a very minute aperture.

The twenty-one species of Helvelleae so far found in Vermont¹ belong in the eight genera: *Morchella*, *Gyromitra*, *Helvella*, *Geoglossum*, *Spathularia*, *Vibrissea*, *Mitrula*, and *Leotia*. For the convenience of those who are working toward a better knowledge of our Vermont and New England species and their distribution, a key to these genera is given and also brief descriptive notes on each species. For the same reason, notes are also included on a few additional species not yet found in Vermont. In the treatment of the subfamily Geoglosseae, I have followed Massee's Monograph of the Geoglosseae,² which seems to have been very carefully prepared and gives, on the whole, the most satisfactory presentation of the genera and species yet published.

KEY TO THE GENERA.

I. Ascigerous portion pileate or mitriform; fructification fleshy, rarely less than 3 cm. high, usually 5 cm. or more and often weighing several ounces Subfamily MORCHELLEAE

1. Ascigerous portion ovoid or conical, with its outer surface deeply pitted by intersecting systems of ridges *Morchella*
2. Ascigerous portion bullate-inflated, gyrose-convolute and somewhat rounded in our single species *Gyromitra*
3. Ascigerous portion reflexed, mitriform-lobate or saddle-shaped, even. One doubtful member of this genus has the ascigerous portion cup-shaped at first, becoming plane *Helvella*

II. Ascigerous portion clavate, spathulate, or capitate; fructifications fleshy or gelatinous, mostly slender, erect, small, and usually less than 5 cm. high; asci opening at the apex by a mere pore for liberation of the spores Subfamily GEOGLOSSAE

¹ Of the Helvelleae, in Frost's list in the Amherst Catalogue of Plants growing within thirty miles of Amherst, Mass., five of the seventeen species there listed are not represented in the present list. These five species are *Helvella lacunosa* Afz., *H. Ephippium* Lev., *Vibrissea truncorum* Fr., *Mitrula cucullata* Fr., and *Rhizina undulata* Fr. As the authorities of Brattleboro', who have control of the Frost Herbarium, have not yet arranged it so that botanists are permitted to consult it, I greatly regret my inability to include in our Vermont list collections of the above five and any other species of Helvelleae which Frost may have made in Vermont in the vicinity of Brattleboro'.

² Annals of Botany **11**: 225-306, pls. 12 and 13. 1897.

- a. Spores elongated, arranged side by side in a bundle in the ascus.* . . . 4-6.
 4. Fructifications clavate, black; spores brown, septate *Geoglossum*
 5. Ascigerous portion obovate, laterally compressed, decurrent down opposite sides of the stem; spores colorless *Spathularia*
 6. Ascigerous portion pileate, free margin incurved towards the stem; spores colorless *Vibrissea*
aa. Spores narrowly ellipsoidal, 1-2-seriate in the ascus 7 and 8
 7. Ascigerous portion subcapitate or clavate, decurrent down the stem *Mitrula*
 8. Ascigerous portion capitate or somewhat discoid, imperfectly hollow, margin thick and incurved towards the stem; fructification more or less gelatinous *Leotia*

MORCHELLA.

1. MORCHELLA ESCULENTA (L.) Pers. Ascigerous portion ovoid, rather obtuse; intersecting systems of ribs often oblique, forming pits rather more round than in the following species; spores 8 to an ascus, $22-24 \times 12-14 \mu$.

In sandy sheep pastures, Burlington (*L. R. Jones*), May 30.

2. MORCHELLA CONICA Pers. Ascigerous portion cylindric-conical; primary ribs longitudinal, secondary ribs transverse, smaller, more like folds; pits narrow and more longitudinally elongated than in *M. esculenta*; spores 8 to an ascus, $16-20 \times 9-12 \mu$. (Figs. 1-1*b*.)

In thin grass under spruce trees, college campus, on lawn, and in mixed woods under oak tree, Middlebury (*Burt*). Five collections, all on clay soil, May 3-28.

3. MORCHELLA ANGUSTICEPS Pk. This is separated from *M. conica* by its generally smaller size, more pointed ascigerous portion, comparatively thicker stem, and larger spores, which are $20-25 \times 13-17 \mu$ (Peck), or $27-32 \times 16-20 \mu$ (Boudier for this species in France).

A single plant collected at Williamstown, Vt., by L. B. Roberts, was sent to Professor Jones. Half of the specimen was sent to Peck and by him referred to *M. angusticeps* Pk.; the other half is in the Herbarium of University of Vermont.

MORCHELLA HYBRIDA Pers. (= *M. semilibera* DC.) differs from each of the above species in having the lower half of its ascigerous portion free from the stem. As it is reported from Massachusetts, New York, and Ontario, it may yet be found in Vermont.

GYROMITRA.

4. GYROMITRA ESCULENTA Pers. Ascigerous portion rounded, gyrose-convolute, bay-red; spores $20-26 \times 10-12 \mu$. (Fig. 2.)

On sandy ground, Burlington (*Jones*), April 29.

GYROMITRA GIGAS (Batsch.) Fr. and G. SPHAEROSPORA Pk., which have been found in New York, have the ascigerous portion whitish or ochraceous; and the latter has spherical spores, $8-10 \mu$ diam.

HELVELLA.

5. HELVELLA INFULA Schaeff. Stem stout, nearly even, pallid; ascigerous portion lobed, deflexed, subcinnamon, somewhat wrinkled at the

center in my specimens, margin adhering closely to the stem; spores $18-20 \times 10 \mu$. The largest specimen in dried state measures 12 cm. high and ascigerous portion 8 cm. broad.

On rotten pine logs by wood roads and on ground in wood roads, Grand View Mt., and mountains near E. Middlebury (*Burt*), August 6 and 26.

The specimens agree closely with the description and with Schaeffer's tab. 159. The species is rather intermediate between *Gyromitra* and *Helvella*, and is sometimes included in the one genus and sometimes in the other. According to Underwood,¹ this species has been found in this country heretofore only in North Carolina and New York.

6. *HELVELLA CRISPA* (Scop.) Fr. Stem deeply and interruptedly sulcate; ascigerous portion deflexed, lobed, often free, crisped, white or whitish; spores $18 \times 10 \mu$. The fructifications are stated to attain a height of 5-15 cm.; my specimens have been small, about 5 cm. high.

In oak woods and by roadside, Lake Dunmore (*Burt*), September 9 and 14.

7. *HELVELLA SULCATA* Afz. Stem sulcate, with deep longitudinal furrows and thin ribs, somewhat lacunose; ascigerous portion nearly black in my specimens, lobed, deflexed, adherent to stem along under surface; spores $16 \times 12 \mu$.

Under side of rotten log in woods, Lake Dunmore (*Burt*), August 31.

My specimens were barely 4 cm. high and on the whole, agree better with *H. sulcata*, if this is to be regarded as a distinct species and not a small form of *H. lacunosa* Afz.

8. *HELVELLA ELASTICA* Bull. Stem slender, even, cylindrical, sometimes compressed with age, 9 cm. long, about 5 mm. thick, white, pruinose; ascigerous portion bilobed, saddle-shaped, decurved at the sides but free from the stem, umbrino-castaneus of Saccardo's *Chromotaxia*, on upper surface, white and finely rugose on under side, 4 cm. long, 2 cm. high; spores $18-22 \times 11-12 \mu$. (Fig. 3.)

Lake Dunmore (*Farlow*); in wet moss in wood, Lost Pleiad Pond (*Burt*), August 31.

As indicated by the above notes, our specimens are the form with dark upper surface to ascigerous portion and with white under surface and stem, figured under the name of *Elvella fuliginosa* in Schaeffer's *Icones*, tab. 320. The other common European form with upper surface of the ascigerous portion yellowish has not yet been found in Vermont.

8a. *H. ELASTICA* var. *FUSCA* Bull. Champ., pl. 242, fig. D. This differs from the forms above in having the under surface of the ascigerous portion and the stem fuscous (ater of *Chromotaxia*); spores $18 \times 10-11 \mu$.

On ground in mixed woods, Lake Dunmore (*Burt*), August.

¹ On the Distribution of N. Amer. Helvellales. Minn. Bot. Studies, Bull. 9: 483.

9. *HELVELLA MACROPUS* (Pers.) Karst. Stem rough, nearly hairy, cinereous, attenuated upwards, even or irregularly lacunose; ascigerous portion cup-shaped at first, then expanded and rarely slightly elevated at the center, under surface hirto-verrucose and cinereous, upper surface even, mouse-brown; spores colorless, $18-20 \times 11-12 \mu$.

Rather common. On moist ground in mixed woods, Sudbury and Middlebury (*Burt*), August 2 and 14.

This species is somewhat intermediate between *Helvella* and the *Pezizeae* but on the ground of its development is generally classed with the latter as *Macropodia macropus* (Pers.) Fk. If one makes first acquaintance of the species with only a fully mature fructification, having the center slightly elevated, he may try to place it as an *Helvella* or a *Verpa*.

HELVELLA EPHIPIUM Lev. is a small species rarely more than $2\frac{1}{2}$ cm. high. It somewhat resembles *H. elastica* in a young state but has the stem and under side of the ascigerous portion villose. It has been reported from Massachusetts and Rhode Island.

GEOGLOSSUM.

10. *GEOGLOSSUM HIRSUTUM* Pers. form *G. FARLOWI* Cke. Fructifications black, clavate, densely velvety, $4-7\frac{1}{2}$ cm. high; with brown setae in the hymenium equaling or but slightly exceeding the asci; spores pale brown, slightly curved, 3-5-septate but most frequently 3-septate; $72-85 \times 5\frac{1}{2} \mu$. (Figs 4-4 c).

On ground in mixed woods, Grand View Mt. (*Burt*), August 26.

Determination as *G. Farlowi* Cke. confirmed by Dr. Farlow. Specimens from this collection were distributed in Ellis & Ev. N. A. Fungi, No. 3532.

Other forms of *G. hirsutum*, most readily distinguished by their spores being more than 5-septate, have been found in New York and Massachusetts and are to be looked for here.

11. *GEOGLOSSUM GLABRUM* Pers. Fructifications black, clavate, about 5 cm. high, with stem minutely squamulose, so as to appear almost hairy; no brown setae in the hymenium; spores brown, narrowly clavate, 7-septate, $85-95 \times 6-8 \mu$; paraphyses with tips curved or sometimes straight. — *G. ophioglossoides* (L.) Sacc.; *G. simile* Pk.

On swampy ground, Abby Pond; on ground in woods, S. Lincoln Notch; on very rotten log in hemlock grove, Lake Dunmore. (*Burt*). August 28, September 2 and 14.

12. *GEOGLOSSUM PECKIANUM* Cke. Fructifications black, glabrous, narrowly lanceolate, 3-6 cm. high; stem viscid; no brown setae in the hymenium; spores brown, 15-septate, $120 \times 7 \mu$; paraphyses with brownish spirally curved and twisted tips. (Figs. 5-5 b).

On ground in mixed woods, Grand View Mt. (*Burt*), August 26.

Determination confirmed by Mr. Peck.

SPATHULARIA.

13. *SPATHULARIA CLAVATA* (Schaeff.) Sacc. Fructifications 3–6 cm. high, compressed, obovate; ascigerous portion bright yellow, obtuse or cleft at the apex, decurrent down opposite sides of the stem, margin crisped; stem white or whitish, glabrous; spores finally multiseptate, $50-65 \times 2\frac{1}{2}-3 \mu$. — *S. flavida* Pers. (Fig. 7.)

Very common, usually in pine woods. Newfane (*C. D. Howe*); Ripton and Middlebury (*Burt*), August 21, 28, and September 9.

Specimens from the Middlebury collection were distributed in Fungi Columbiani, No. 1213.

SPATHULARIA RUGOSA Pk. Rep. N. Y. Mus. 50: 118, has been recently separated from *S. clavata* on account of rugose stem and shorter spores $40-60 \times 2 \mu$; its form and coloration are the same.

14. *SPATHULARIA VELUTIPES* Cke. & Farlow. Form and size as in *S. clavata*, but ascigerous portion is tawny yellow and stem minutely velvety, dark brown; spores $55-60 \times 1\frac{1}{2} \mu$. (Fig. 6.)

On mossy trunks in damp woods, Lake Willoughby (*Farlow*); on mossy log, Lake Dunmore, and on ground in spruce and pine woods, Abby Pond and Middlebury (*Burt*). August 17, 28 and September 20.

VIBRISSEA.

15. *VIBRISSEA CIRCINANS* (Pers.) Hazsl. Fructifications gregarious, 2–4 cm. high; ascigerous portion pileate, pale yellowish flesh-color or yellowish, under surface concave, minutely wrinkled, the ridges running down the apex of the stem; stem pallid or reddish, pulverulent, glabrous; spores finally multiseptate, $50-60 \times 2 \mu$. (Figs. 8–8c.) — *Leotia circinans* Pers.; *Cudonia circinans* (Pers.) Fr.

Burlington (*L. R. Jones*); on ground in pine woods, Middlebury (*Burt*). September 20.

Specimens from the Middlebury collection were distributed in Ellis & Ev. N. A. Fungi, No. 3533.

16. *VIBRISSEA LUTEA* Pk. Fructifications gregarious, $1\frac{1}{2}-2\frac{1}{2}$ cm. high, yellow; ascigerous portion subglobose, with margin slightly lobed, inflexed; stem nearly equal, solid, glabrous, a little more highly colored than the ascigerous portion, longitudinally wrinkled when dry; spores $72 \times 2\frac{1}{2} \mu$ ($80-90 \times 2\frac{1}{2} \mu$ Masee); paraphyses with spirally curved tips in my specimens.

On rotting beech leaves in moist wooded ravine, S. Lincoln Notch (*Burt*), September 2.

Our specimens have been seen by Mr. Peck and the determination authenticated.

VIBRISSEA TRUNCORUM Fr. has been found in New York, Massachusetts, and New Hampshire and probably occurs in Vermont. It is an aquatic fungus, growing on submerged, decaying wood, branches and leaves, and attaining its best development in mountain streams. It is 1–2 cm. high; ascigerous portion deep orange-red; stem minutely velvety or squamulose; spores $200 \times 1 \mu$.

MITRULA.

17. MITRULA OLIVACEA (Pers.) Sacc. Fructifications gregarious or caespitose, 2-4½ cm. high, hollow, very irregularly compressed, slimy or greasy to the touch but not viscid; ascigerous portion tawny-olivaceous, or greenish umbrinus, glabrous; stem paler than the ascigerous portion and more olivaceous, glabrous, shining; spores slightly curved, usually 4-5-guttulate and simple, but in an old specimen just beginning to decay rarely 3-septate, 15 x 5 μ . (Figs. 11-11b.) *Geoglossum olivaceum* Pers.; *Leptoglossum olivaceum* (Pers.) Cke.

In wood road, Grand View Mt. (Burt). August 26.

The spore dimensions agree with those given by Rehm in Rabenhorst's Pilze and by Massee, but are smaller than stated in Phillips' Discomycetes or in Saccardo's Sylloge (25 x 8 μ). Through the kindness of Dr. Farlow I have been permitted to compare our specimens with European specimens of the closely related species *Mitrula viridis* and *M. olivacea*, distributed as *Leotia viridis* (Pers.) in Kunze's Fun. sel. No. 196 and *Leptoglossum olivaceum* (Pers.) in Phillips' Elv. Brit. No. 5. Our specimens are referred to *M. olivacea* on account of the glabrous stem. I am not aware that this species has been found heretofore in N. America; *M. viridis*, which has the stem minutely squamulose or granulose, is reported for S. Carolina and Pennsylvania.

18. MITRULA LARICINA (Villars) Massee. Fructifications gregarious, 2-6 cm. high; ascigerous portion broadly ovoid or subglobose, often more or less compressed, egg-yellow to orange-red, hollow; stem white or with a tinge of pink or yellow; spores 14-20 x 3 μ . *Mitrula phalloboides* (Bull.) Chev.; *Mitrula paludosa* Fr.

On leaves in drying pools, Abby Pond, Ripton (Burt). June 26.

19. MITRULA VITELLINA (Bres.) var. IRREGULARIS Pk. Fructifications 2½-5 cm. high; ascigerous portion clavate, often irregular or compressed and somewhat lobed, tapering below into the short, rather distinct, yellowish or whitish stem; spores uniseriate, 10 x 5 μ .

In path on the western ascent of Mt. Mansfield* (L. R. Jones & Burt). September 8.

Specimen seen by Mr. Peck and determination authenticated.

20. MITRULA RUFA (Schw.) Massee. Fructifications gregarious or scattered, 3-5 cm. high, varying in color from rufous or dusky brownish olive to dingy yellow; ascigerous portion narrowly ellipsoidal or clavate, often more or less laterally compressed and longitudinally rugulose, glabrous, 1-2 cm. long, 4-7 mm. broad, not sharply differentiated from the thinner, and usually paler, minutely squamulose stem; spores 8, irregularly 2-seriate, hyaline, slightly curved, 25-35 x 5-6 μ , at first multiguttulate, finally 5-septate, paraphyses with tips slightly thickened and more or less curved. *Geoglossum rufum* Schw.; *Mitrula lutea* Mont.; *Geoglossum luteum* Pk.; *Mitrula lutescens* B. & C.; and *Geoglossum pistillaris* B. & Cke. are given as synonyms by Massee, the types

to which they refer — all from America — being too closely intergraded for specific separation.

Two extreme forms of this series occur in Vermont, but with such close agreement in their spores and paraphyses as to favor Masee's conclusion. These forms are : —

a. Geoglossum rufum Schw. of Schweinitz's Syn. Fung. Amer. Bor. n. 1011. Fructification glabrous, rufous, subrugose, more than $2\frac{1}{2}$ cm. high; ascigerous portion broadly clavate, obtuse at the apex; spores $28-36 \times 5 \mu$; paraphyses with the tips strongly curved. (Figs. 9 and 9*a*.) Amongst sphagnum, Lake Dunmore (*Farlow*), September.

This specimen was determined by Dr. Farlow as *G. rufum* Schw.

b. Geoglossum luteum Pk. of Rep. N. Y. Mus. 24: 94. Fructifications more dingy yellow in color; ascigerous portion usually narrower; stem minutely squamulose; spores $26-36 \times 5 \mu$; paraphyses less strongly curved. (Fig. 10.) Immature specimens agree with the description and figures of *Mitrula lutescens* B. & C.

Very common. On mossy banks and on humus of wood in woods, Belden's Falls, South Lincoln Notch, Lake Dunmore (*Burt*). July 20, September 2, 9 and 14.

A Lake Dunmore collection has been seen by Mr. Peck and the determination as *Leptoglossum luteum* (Pk.) authenticated.

MITRULA CUCULLATA Fr. has been collected in New York and Massachusetts and is to be looked for in Vermont. The fructifications grow on the fallen leaves of pine and various conifers and are from 1-2 cm. high; ascigerous portion irregularly obovoid, orange-yellow or orange-brown; stem very slender, usually crooked, glabrous, brown; spores $12-18 \times 3 \mu$.

LEOTIA.

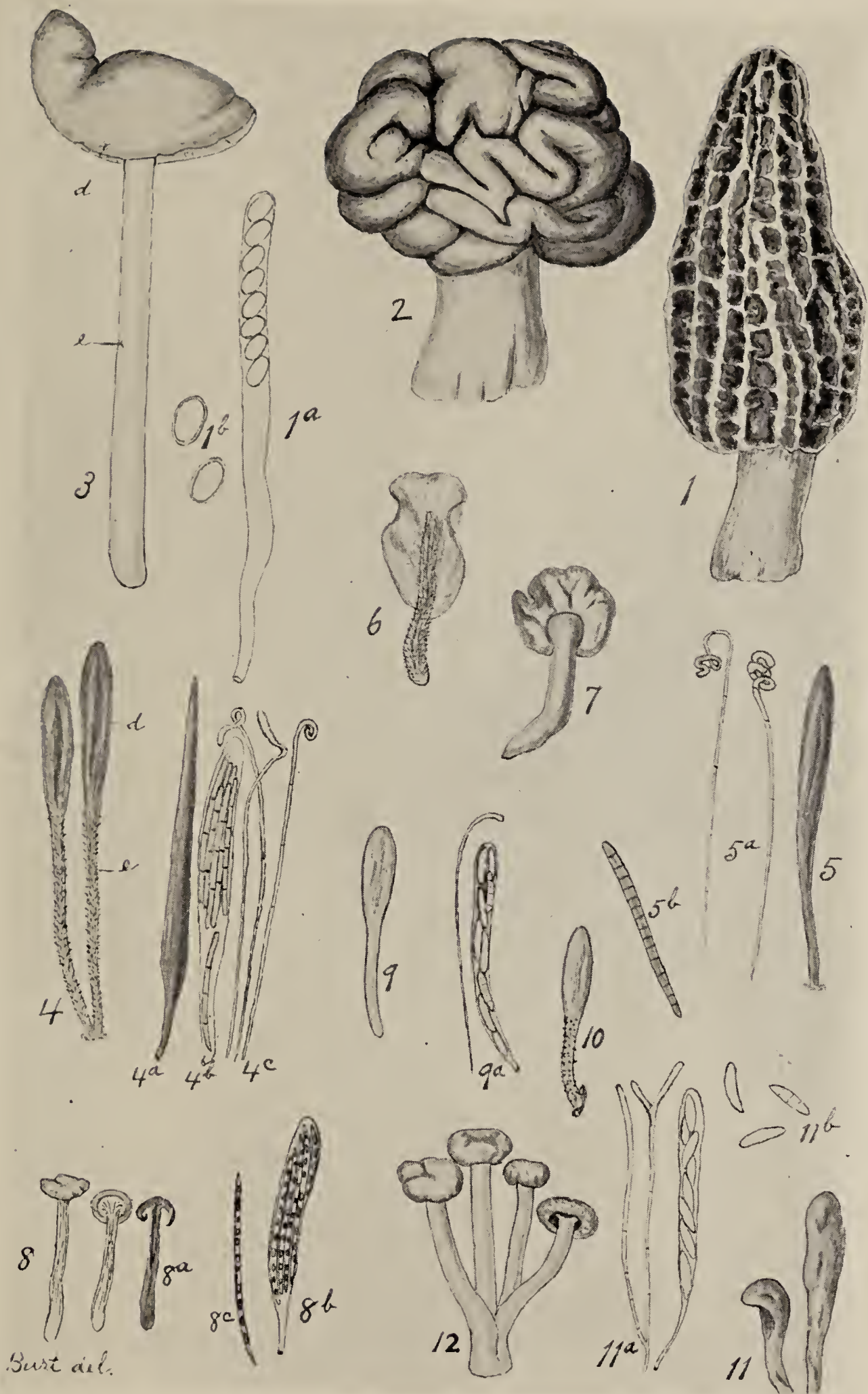
21. LEOTIA LUBRICA Pers. Fructifications gregarious or in small clusters, somewhat gelatinous, 4-8 cm. long; ascigerous portion yellowish green to dark-green; stem not squamulose; spores finally 5-septate, $20-24 \times 5-6 \mu$. (Fig. 12.)

Common on damp ground in woods, Lake Horton, Abby Pond, South Lincoln Notch (*Burt*), August 15, 28, September 2.

SPRAGUEOLA AMERICANA Masee has been founded on a single New England collection by Sprague and should be especially looked for. The genus belongs in the section with Mitrula but differs from Mitrula in having the ascigerous portion strictly sessile. The fructification is subglobose in form, $1\frac{1}{2}-2\frac{1}{2}$ cm. diam., coarsely nodulose, glabrous, pale ochraceous tan; spores obliquely uniseriate, continuous, $6\frac{1}{2}-7 \times 3\frac{1}{2} \mu$. *Mitrula crispata* Fr. in Berk. Notices N. A. Fungi No. 704.* Grev. 3: 149.

MIDDLEBURY COLLEGE, MIDDLEBURY, VT.

EXPLANATION OF PLATE 4. — Fig. 1, *Morchella conica* (copied from Cooke's Mycographia), $\times \frac{2}{3}$; fig. 1*a*, ascus containing 8 spores, $\times 200$; fig. 1*b*, 2 spores, i.e. ascospores, $\times 333$. Fig. 2, *Gyromitra esculenta* (copied from Gillet's Discomycetes), $\times \frac{2}{3}$. Fig. 3, *Helvella esculenta*; *d*, its ascigerous portion; *e*, its stem, $\times \frac{2}{3}$. Fig. 4, *Geoglossum Farlowi*; *d*, its ascigerous portion; *e*, its stem, $\times \frac{2}{3}$; fig. 4*a*, seta from hymenium, $\times 200$; fig. 4*b*, ascus containing 8 spores, $\times 200$; fig. 4*c*, 3 paraphyses, $\times 200$. Fig. 5, *Geoglossum Peckianum*, $\times \frac{2}{3}$; fig. 5*a*, 2 of its paraphyses, $\times 200$; fig. 5*b*, a spore,



VERMONT HELVELLEAE.

x 200. Fig. 6, *Spathularia velutipes*, x $\frac{2}{3}$. Fig. 7, *Spathularia clavata*, x $\frac{2}{3}$. Fig. 8, *Vibrissea circinans*, x $\frac{2}{3}$; fig. 8a, median longitudinal section of same; fig. 8b, ascus, x 200; fig. 8c, spore, x 333. Fig. 9, *Mitrula rufa* form *Geoglossum rufum* Schw., x $\frac{2}{3}$; fig. 9a, ascus and paraphyses of same. Fig. 10, *Mitrula rufa* form *Geoglossum luteum* Pk., x $\frac{2}{3}$. Fig. 11, *Mitrula olivacea*, x $\frac{2}{3}$; fig. 11a, ascus and paraphyses, x 333; fig. 11b, 3 of its spores, x 333. Fig. 12, *Leotia lubrica*, x $\frac{2}{3}$.

CORRECTION IN REGARD TO VIBRISSEA CIRCINANS (PERS.) MASSEE. — This species was incorrectly included in the list of Vermont Helvelleæ, in the April RHODORA. The collection should have been referred to *Vibrissea lutea* Pk., which Figs. 8–8c, Pl. 4, therefore illustrate.

I am under obligation to Drs. Farlow and Thaxter for directing my attention to the error, and to Dr. Farlow for an opportunity to examine *Leotia circinans* Pers. in Klotzsch Herb. Viv. Myc. 139, in Linhart Fungi Hungarici 59, and in Rabenhorst Fungi Europ., Series 2, No. 39, from all of which my specimens are quite different. — E. A. BURT.

GLOSSARY

FOR STUDENTS OF THE

FLESHY FUNGI

W. G. FARLOW.

Boston Mycological Club

Bulletin No. 10.

(Issued, July, 1899).

GLOSSARY

FOR

STUDENTS OF THE FLESHY FUNGI

COMPILED BY

EDWIN A. DANIELS, M.D.

NOTE.

In the case of certain terms to be found in this glossary the definitions are not those of the strictest botanical usage; they are rather interpretations of such terms as they have been applied to fungi.

To indicate the length of accented vowels a mechanical plan of dividing the words (ignoring the syllabic structure) has been adopted, as follows: if the break follows a vowel that vowel is long as Azo'nate; if the break follows a consonant the preceding vowel is short as Paraph'ysis.

The compiler, while accepting the entire responsibility for the glossary and especially for the errors which it may contain, desires to express appreciation and thanks to Mr. Hollis Webster, Miss Jennie F. Conant, Prof. E. A. Burt, and others who have very kindly assisted by advice and suggestion.

EDWIN A. DANIELS.

Boston, June, 1899.

GLOSSARY *

A-, prefixed signifies absence; as aseptate, without septa.

ABBREVIATED, shortened.

ABBREVIATIONS:

! expresses certainty.

? expresses doubt.

c. m. = centimeter.

c. c. = cubic centimeter.

m. m. = millimeter.

μ. = micron.

in. = inch.

° foot or feet.

' inch or inches.

" line (1-12 inch) or lines.

eu. sometimes written after the name of a species to indicate that it is certainly a well developed species, not a variety.

nov. gen. = new genus.

n. sp. = new species.

v. icon. = a figure of the plant seen.

v. s. = seen in a dried state.

v. sp. = seen wild.

v. v. = seen alive.

x before a figure means magnified that number of times; x 50 = magnified 50 times. *Between* two figures signifies *by*; 2 x 4 = 2 by 4.

— between two figures = to; 2 — 4 = from 2 to 4.

* at end of a citation, denotes that a plant is fully described in the place referred to.

ABER'RANT, differing in some of its characters from the group in which it is placed; said of an individual, species, genus, etc.

ABJEC'TION, throwing off with force, as spores or seeds.

ABJOINT', to joint off or delimit by septa.

ABNOR'MAL, not conforming to the usual type; irregular; unnatural.

ABORIG'INAL, indigenous; native.

ABOR'TIVE, imperfect or wanting.

ABRUPT', terminating suddenly.

ABSTRIC'TION, separation of one part from another by constriction, especially of spores from their hyphae.

ACAULES'CENT, ACAU'LINE ACAU'LOSE, ACAU'LOUS, stemless.

AC'EROSE, narrow, stiff, and pointed, like spruce needles; intermediate in form between acicular and subulate.

ACETAB'ULIFORM, deep saucer-shaped, with a broad concave bottom and nearly upright sides.

ACH'ROOUS, colorless.

ACIC'ULA, (pl. ACIC'ULAE), a needle shaped spine, prickle, or other body.

ACIC'ULAR, ACIC'ULATE, AC'IFORM, slender needle—or bristle—shaped, as the leaves of most pines.

AC'ROGEN, a cryptogam which increases by development at the summit of an axis, having a true stem, leaf-like appendages, etc.; as ferns, mosses, etc., see Amphigen.

ACROG'ENOUS, (a) produced at the apex, as some spores from the apex of a hyphal branch; (b) of the nature of or pertaining to acrogens.

ACROP'ETAL, in the direction of the summit.

ACU'LEATE, ACU'LEATED, having prickles; prickle-pointed.

ACU'LEUS, (Pl. ACU'LEI), a prickle.

ACU'MINATE, ending in a prolonged tapering point.

ACUTE', ending in a distinct angle but not prolonged; applied to lamellae having sharp edges, or to those pointed at either end.

ADHE'RING, sticking together of dissimilar parts.

AD'NATE, attached or grown together; said of lamellae broadly attached to the stipe.

ADNEXED', applied to lamellae attached to the stipe but not adnate.

ADPRESSED', lying close, appressed.

ADVENTI'TIOUS, appearing casually, or in an abnormal or unusual position or place.

AERU'GINOSE, AERU'GINOUS, verdigris-green.

AFFIN'ITY, true or near relationship.

AGAM'IC, AG'AMOUS, sex-less.

AG'AMOGEN'ESIS, asexual reproduction.

AGAM'OSPORE, spore formed without fertilization.

AG'ARIC, any gill-bearing fungus; formerly applied only to members of the genus *Agaricus*.

AGAR'ICOID, of the nature of an agaric; mushroom-like.

AGGLOM'ERATE, (a) clustered densely, but not connected together, (b) gathered into a rounded mass or into a compacted heap or pile.

AGGLU'TINATE, as if glued together; applied to fungi that are firmly attached to matrix.

AG'GREGATE, AG'GREGATED, collected together but not cohering; about the same as agglomerate.

ALBU'MENOID, an organic substance containing nitrogen in its composition, as protoplasm.

ALLAN'TOID, sausage-shaped.

ALLIA'CEOUS, having the odor of onions.

AL'PINE, growing on mountains above the timber-line.

*Copies may be obtained of the treasurer of the Boston Mycological Club. Price twenty-five cents.

- ALUTA'CEOUS, light leather colored; color of soiled linen; isabelline.
- ALVE'OLATE, deeply pitted, so as to resemble honey-comb.
- AMBIG'UOUS, indistinct or doubtful; cannot well be referred to any definite condition or place in a system of classification.
- AMOR'PHOUS, without definite form, structure, or position.
- AM'PHIGEN, a thallogen; a name applied to a cryptogam which increases by development of cellular tissue in all directions and not at the summit of a distinct axis; see Acrogen.
- AMPHIG'ENOUS, (a) growing all around an object; applied to a hymenium which grows on all the surfaces of a fungus, as in *Clavaria*, or to fungi which are not restricted to any particular part of the surface of the host; (b) of or pertaining to amphigens.
- AMYG'DALINE, resembling the almond.
- AMYLA'CEOUS, composed of, containing, or resembling starch.
- AM'YLUM, starch.
- ANAL'OGOUS, resembling, agreeing or corresponding in relations, functions, or structure with another object; having analogy.
- ANAL'OGY, resemblance without affinity; resemblance in certain respects, as in general appearance or functions.
- ANAL'YSIS, the systematic examination of a plant preliminary to determination of its position in classification.
- ANAS'TOMOSING, intercommunicating or interlacing of veins, lines or any branched system; said of lamellae that are united by transverse veins or partitions.
- ANGIOCAR'POUS, having the hymenium developed in a closed receptacle.
- AN'GIOSPERM, a plant whose seeds are contained in a protecting seed-vessel; (most deciduous trees and herbaceous plants).
- ANGIOS'POROUS, having spores or asci produced in a closed receptacle.
- ANGUS'TATE, narrow.
- AN'NUAL, completing growth in one year or season.
- AN'NULAR, ring-shaped.
- AN'NULATE, bearing a ring.
- AN'NULUS, the ring on the stipe of a mushroom formed by the separation of the veil from the margin of the cap.
- ANOM'ALOUS, deviating from a general rule, method, or analogy.
- ANOM'ALY, any deviation from the usual character.
- ANTE'RIOR, in front; denotes a position on the under side of the pileus adjacent to the margin; thus the end of a lamella next the margin is called the anterior end.
- ANTICLI'NAL, said of cell walls or any lines when perpendicular to the outer surface.
- ANTI'COUS, facing anteriorly.
- APARAPH'YSATE, without paraphyses.
- A'PEX, (pl. AP'ICES), the summit; the end furthest from the base or point of attachment.
- AP'ICAL, relating to the apex or top.
- AP'ICES, plural of apex.
- APIC'ULATE, tipped with a short and abrupt point.
- APIC'ULUS, (pl. APIC'ULI), a short sharp point.
- APOTHE'CIUM, (pl. APOTHE'CIA), in Ascomycetes, an open cup-shaped fructification with the hymenium on its upper concave surface; cup.
- APPENDIC'ULATE, provided with or having the character of an appendage or appendages; hanging in small fragments, as the ruptured veil sometimes from the margin of the pileus.
- AP'PLANATE, flattened out or horizontally expanded.
- APPRESSED' applied closely to the surface or to each other; adpressed.
- APPROX'IMATE, near in position; said of lamellae, where they approach the stipe but do not reach it.
- AQUAT'IC, growing in water.
- A'QUEOUS, watery; nearly colorless; hyaline.
- ARACH'NOID, like cobweb.
- ARBO'REAL, growing on trees.
- AR'CUATE, curved like a bow.
- ARENA'CEOUS, ARENA'RIOUS, AR'ENOSE, sandy; growing in sandy places.
- ARE'OLATE, applied to a surface divided into little areas or patches.
- ARGILLA'CEOUS, resembling or containing a considerable amount of clay; clay-colored; drab.
- AR'ID, dry.
- ARIS'TATE, having a pointed beard-like process as in barley.
- ARMIL'LA, a plaited frill hanging from the apex of the stipe.
- ARTIC'ULATE, jointed.
- ARTICULA'TION, joint.
- ASCEND'ING, applied to a lamella where its edge forms a line ascending in the direction from the margin of pileus toward the apex of the stipe, as in conical shaped pilei; applied to the partial veil when in the young stage its stipe-attachment is below the level of its marginal one; in this case a ring formed from it is called inferior.
- ASCIF'EROUS, ASCOPH'OROUS, ascus-bearing.
- ASCIG'EROUS, bearing asci.
- AS'COCARP, in Ascomycetes, sporocarp producing asci and ascospores.
- ASCOG'ENOUS, producing asci.
- ASCOMYCE'TES, group of fungi in which the spores are produced within little sack-like cells, called asci.
- ASCOMYCE'TOUS, of or pertaining to the ascomycetes.
- AS'COPHORE, sporophore bearing an ascus or asci.
- ASCOPH'OROUS, bearing an ascus or asci.
- AS'COSPORES, spores formed within an ascus.

AS'CUS, (pl. AS'CI), microscopic sack-like cell in which spores, generally eight in number, are developed.

ASEP'TATE, without partitions or septa.

AS'PERATE, AS'PERATED, having a rough uneven surface.

AS'TICHOUS, not arranged in rows.

ASTIP'ITATE, having no stipe.

ASTO'MATOUS, without a mouth or aperture; without stomata.

AS'TOMOUS, without a stoma or mouth.

AT'AVISM, resemblance to a distant ancestor; remote heredity.

AT'OM, an extremely minute particle of matter.

AT'OMATE, covered with small atoms.

ATRO-, in composition, 'black' or 'dark.'

A'TROPURPU'REOUS, dark purple.

ATROSANGUIN'EOUS, dark purple; dark blood-color.

ATTEN'UATE, becoming gradually narrowed or smaller.

AURANTI'ACOUS, orange-colored.

AUR'EOUS, golden yellow; yellow with a slight tinge of red.

AURIC'ULATE, AUR'IFORM, ear-shaped.

AUTO-BASID'IUM, an unseptated basidium giving rise at the apex to four slender sterigmata (sometimes fewer sometimes more) each bearing a spore.

AUTON'OMOUS, said of plants that are perfect and complete in themselves; not forming part of a cycle; independent.

AX'IS, the central line of growth; stipe, stalk, etc.

AZO'NATE, without zones or circular bands of different color.

BAC'CATE, berry-like.

BA'DIOUS, bay; reddish-brown; chestnut color.

BAND, a broad bar of color.

BAN'DED, marked with bands.

BASE, the extremity opposite to the apex; the part of an organ nearest its point of attachment; applied to lamellae, (a) the line of attachment to the pileus, (as connected by veins at the base); (b) sometimes used to define the end attached to the stipe (broad or reticulate at the base).

BASID'IOGENET'IC, produced upon a basidium.

BASIDIOMYCE'TES, group of fungi which has its spores produced on basidia.

BASID'IOPHORE, a sporophore bearing basidia.

BASID'IOSPORE, spore acrogenously abjoined upon a basidium.

BASID'IUM, (pl. BASID'IA), mother cell in the hymenium of Basidio-mycetes formed on the end of a hyphal branch and abstricting spores; the spores are generally four in number, each on a sterigma, but sometimes more sometimes fewer and sometimes sessile; see autobasidium and proto-basidium.

BASIP'ETAL, in the direction of the base.

BEHIND', same as posterior, which see.

BI-, prefix meaning 'twice.'

BIB'ULOUS, having the quality of absorbing or imbibing moisture.

BICIP'ETAL, BICIP'ITOUS, in botany, divided into two parts at the top or bottom.

BI'FID, cleft or divided into two parts.

BIFUR'CATE, twoforked; divided into two branches.

BILOC'ULAR, two-celled.

BIOG'ENOUS, growing on living organisms.

BISE'RIATE, BISE'RIAL, arranged in two rows.

BIS'TER, BIS'TRE, of the color of bitter, blackish-brown.

BIOLOG'IC, BIOLOG'ICAL, pertaining to biology or the science of life.

BIOL'OGY, the science of life and living things in the widest sense.

BI'ON, an individual morphologically and physiologically independent.

BOOT'ED, peronate.

BOSS, a knob or short rounded protuberance; umbo.

BOSS'ED, furnished with a boss.

BUL'BOUS, said of the stipe of a mushroom when it has a bulblike swelling at the base.

BULL'ATE, bearing a short rounded protuberance; blister-shaped; bossed.

BYSSA'CEOUS, BYS'SOID, resembling or consisting of fine filaments, like fine flax or cotton.

BYS'SUS, on old name for the filamentous mycelium of certain fungi.

CAE'SIOUS, pale bluish-gray; lavender colored.

CAES'PITOSE, CAES'PITOUS, CES'-PITOSE, united in tufts.

CALCA'REOUS, of lime, or of the nature of lime.

CALLOS'ITY, CAL'LUS, a hard or thickened spot or protuberance.

CALYP'TRA, hood; applied to that portion of the volva covering the top of the pileus.

CAMPAN'ULATE, bell-shaped.

CANALIC'ULATE, traversed by small canals.

CAN'CELLATE, reticulated; latticed.

CAN'DIDOUS, shining white

CANES'CENT, covered with whitish or gray pubescence.

CAP, pileus; the expanded umbrella-like receptacle of the toadstool.

CAP'ILLARY, pertaining to or resembling hair.

CAPIL'LIFORM, in the shape or form of a hair.

CAPILLIT'IUM, thread-like tubes or fibres, often branched or combined in a net, interpenetrating the mass of spores within a ripe sporogenous body—as in Lycoperdon.

CAP'ITATE, having a head, or the form of a head.

CAPIT'ULUM, a small head.

CAP'SULE, an enclosing envelope usually thin and membranous.

CARBONA'CEOUS, rigid, blackish, and brittle; like or composed of carbon or coaly matter.

CAR'INATE, furnished with a keel or projecting longitudinal line.

CA'RIOUS, decaying; decayed.

CAR'NEOUS, of a fleshy substance; flesh-colored.

CAR'NOSE, fleshy.

CARTILAG'INOUS, firm and tough; gristly.

CASTA'NEOUS, chestnut-colored.

CAU'DATE, having a tail-like appendage.

CAULIC'OLOUS, growing on herbaceous stems.

CELL, (a) a little cavity, compartment or hollow place; (b) a mass of protoplasm of various size and shape, generally microscopic, with or without a nucleus and enclosing wall, the fundamental form-element of every organized body.

CELL'ULAR, composed of cells.

CELL'ULOSE, the essential constituent of the primary wall-membrane of cells, a secretion from the contained protoplasm; allied to starch, sugar and inulin.

CENTRIF'UGALLY, from the centre, outwards.

CENTRIP'ETALLY, from the circumference toward the centre.

CE'PAEFORM, onion-shaped.

CERA'CEOUS, waxy.

CEREB'RIFORM, brain-shaped.

CER'VINE, fawn-colored.

CHAN'NELED, grooved; hollowed out; trough-like; canaliculate.

CHARTA'CEOUS, like paper.

CHLAM'YDOSPORES, (encased spores) are thick walled resting spores usually formed in rows on hyphae; are regarded as rudiments of sporangia or conidiophores which interrupted in development have assumed the form of spores; on germination they usually develop into sporangia or conidiophores.

CHLO'ROPHYLL, the green coloring matter of plants.

CHLORO'SIS, blanching; whitening; etiolation.

CIL'IA, (plural of CIL'IUM), short, straight, parallel hairs, fringing the margin.

CIL'IATE, fringed with cilia.

CINE'REOUS, ash-colored.

CIN'NABARINE, cinnabar-colored; brilliant red, vermilion.

CINNAMO'MEOUS, cinnamon colored.

CIR'CINATE, disposed in a circle; circular; rolled inwards from the summit towards the base.

CIRCUMSCIS'SILE, opening or dividing by a circular or equatorial line.

CIT'RINE, CIT'REOUS, CIT'RINOUS, lemon-yellow-colored.

CLATH'RATE, CLATH'ROID, latticed.

CLA'VATE, CLAV'IFORM, club-shaped; gradually thickened towards the top. the top.

CLEIS'TOCARP, CLIS'TOCARP, an ascocarp which is entirely closed, and from which the spores escape by its final rupture.

CLOSE, said of lamellae when they are close together.

COALES'CENT, growing together of similar parts; coherent.

COCH'LEATE, COCHLEAR'IFORM, shaped like a snail-shell.

COERU'LEOUS, CERU'LEOUS, light blue; sky blue.

COHE'RENT, sticking together of similar parts; sometimes used in the sense of connate.

COLLEN'CHYMA-LAYER, in Geaster, etc., a cartilaginous-gelatinous tissue, hygroscopic and with great capacity for swelling, forming one of the inner layers of the peridium; its swelling at maturity causes the outer peridium to burst outwards in a stellate manner.

COLLIC'ULOSE, covered with little hill-like elevations.

COL'LOID, like glue or jelly.

COLUMEL'LA, a sterile tissue rising column-like in the midst of the capillitium.

CO'MATE, CO'MOSE, CO'MOUS, furnished with a tuft of silky hairs; hairy.

COMMEN'SALISM, symbiosis.

COM'PLANATE, flattened vertically to a level surface above and below.

COMPRESSED', flattened laterally.

CONCAT'ENATE, linked together in a chain.

CONCAVE', having a rounded incurved surface.

CONCEN'TRIC, having a common centre, as a series of rings one within the other.

CONCEP'TACLE, a closed sporiferous body.

CON'CHIFORM, shell-shaped; resembling a clam-shell in shape.

CONCOL'OROUS, of a uniform color.

CONCRES'CENT, growing together.

CON'CRETE, coalescent; united in a coagulated, condensed or solid state; grown together.

CONFER'VOID, loose and filamentous.

CON'FLUENT, blended into one.

CON'GENER, of the same genus or kind.

CONGENER'IC, CONGENER'ICAL, CONGEN'EROUS, belonging to or nearly allied to the same genus.

CONGENET'IC, produced at the same time or by the same cause; alike in origin.

CONGLO'BATE, collected in a sub-spherical mass.

CONGLO'MERATE, densely clustered; gathered into a round mass; composed of heterogeneous materials.

CONGLU'TINATE, as if glued together.

CONID'IAL, pertaining to or of the nature of a conidium or conidia; characterized by the formation of conidia; bearing conidia.

CONIDIIF'EROUS, CONIDIOPH'OROUS, bearing conidia.

- CONID'IOPHORE, a hypha from which are abstricted conidia.
- CONID'IUM, (pl. CONID'IA), asexual spore formed singly or in chains by abstriction from the ends of hyphae or hyphal branches; see under 'spore.'
- CO'NIFER, a cone bearing tree.
- CONIF'EROUS, applied to trees bearing cones.
- CONJUGA'TION, union of two cells to form a spore.
- CON'NATE, grown together from the first.
- CONNI'VENT, having an inward direction, converging, coming in contact; said of a cup whose sides curve inward and meet at the margin.
- CON'SORTISM, see 'Symbiosis.'
- CON'STANT, always present, or always in the same condition.
- CONSTRIC'TED, contracted so as to be smaller in one or more places than in others.
- CON'TEXT, texture; substance.
- CONTIG'UOUS, near, or in contact.
- CONTIN'UOUS, not deviating from uniformity, reverse of interrupted; applied to spores or hyphae that have no septa.
- CONTOR'TED, distorted, twisted, crooked, or deformed.
- CON'VEX, elevated and regularly rounded; forming the segment of a sphere or nearly so.
- CONVEX'O-PLANE, between convex and flat.
- CON'VOLUTE, covered with irregular convexities and depressions resembling the convolutions of the brain.
- COR'DATE, heart-shaped.
- CORIA'CEOUS, of a leathery texture.
- COR'NEOUS, of a horny texture.
- COR'RUGATE, COR'RUGATED, wrinkled; contracted; puckered; having a wrinkled appearance.
- COR'TEX, the bark; the rind; the outer rind-like layer or layers of some fungus-bodies.
- COR'TICAL, of or pertaining to the cortex.
- COR'TICATE, COR'TICATED, having a cortex or rind.
- CORTI'NA, marginal veil of spider-web structure rupturing at or near the stipe.
- COR'TINATE, provided with or pertaining to a cortina.
- COS'TATE, having a ridge or ridges as if ribbed.
- CRATE'RA, a cup-shaped receptacle.
- CRATER'IFORM, basin or saucer-shaped; having the form of a crater.
- CRE'NATE, scalloped.
- CREN'ULATE, minutely crenate.
- CRETA'CEOUS, chalky; of the color of chalk.
- CRIB'RATE, CRIB'RIFORM, CRIB'ROSE, sieve-like; perforated with small holes.
- CRI'NITE, having a tuft or fringe of long weak hairs.
- CRISP, CRISPED, CRIS'PATE, having the surface, especially near the margin, strongly and finely undulate, as the leaves of the Savoy cabbage.
- CRIS'TATE, crested; bearing a ridge, mane or tuft on the top.
- CRU'CIATE, CRU'CIFORM, having the form of a cross with equal arms.
- CRUSTA'CEOUS, of hard and brittle texture.
- CRYP'TOGAM, a plant of the order cryptogamia.
- CRYPTOGA'MIA, flowerless plants propagated by spores.
- CRYPTOGAM'IC, CRYPTOG'AMOUS, pertaining or relating to cryptogamia.
- CRYPTOG'AMIST, one who is skilled in cryptogamic botany.
- CRYPTOG'AMY, obscure fructification, as in plants of the class Cryptogamia.
- CULM, the stem of grasses.
- CU'NEATE, CUNE'IFORM, wedge-shaped.
- CUP, see apothecium.
- CU'PREOUS, copper-colored.
- CU'PULAR, CU'PULATE, cup-shaped.
- CU'PULE, CU'PULA, a receptacle shaped like a little cup, as in *Peziza*.
- CURLED, same as crisp.
- CURT, short.
- CUR'TAIN, same as cortina.
- CUS'PIDATE, tipped with a sharp, rigid point.
- CU'TICLE, a distinct skin-like layer; cutis, cuticle, pellicle, and epidermis have been used indiscriminately to describe the separable or inseparable skin-like layer sometimes present on the outer surface of the pileus and stipe; of these terms, cuticle is used most commonly.
- CU'TIS, see cuticle.
- CYA'NEOUS, bright-blue; azure; lapis lazuli-blue.
- CY'ATHIFORM, cup-shaped, shape of a drinking glass slightly widened at the top.
- CYLIN'DRIC, CYLIN'DRICAL, cylinder-shaped; applied to a branch or stipe having the same or nearly the same diameter throughout, and its cross section circular.
- CYM'BAEFORM, CYM'BIFORM, boat-shaped.
- CYST, a bladder-like cell or cavity.
- CYSTID'IUM, (pl. CYSTID'IA), in Hymenomycetes; large unicellular, often inflated structure, between and often projecting beyond the basidia and paraphyses of the hymenium; (anther, antheridium, old terms for the same.)
- DAUGHTER-CELL, any cell when mentioned in relation to the one (mother-cell) from which it was derived.
- DEAL'BATE, as if white-washed; covered with very white opaque powder.
- DECID'UOUS, (a) falling off at maturity, or at the end of the season, (b) losing the foliage every year.
- DECOR'TICATE, DECOR'TICATED, denuded of bark; destitute of a cortex or cortical layer.

- DECUM'BENT, applied to a stipe having the lower part resting on the ground.
- DECUR'RENT, applied to lamellae which are prolonged down the stipe.
- DECURVED', curved downward.
- DEFLEXED', bent or turned down.
- DEHIS'CENCE, the spontaneous opening of a peridium at maturity to discharge the spores.
- DEHIS'CENT, opening at maturity to discharge the spores.
- DELIQUES'CENT, becoming liquid at maturity.
- DELIMITA'TION, the marking, fixing or prescribing of limits or boundaries.
- DEN'DROID, DEN'DRIFORM, tree-shaped.
- DEN'TATE, toothed.
- DENTIC'ULATE, finely dentate.
- DENU'DATE, naked; exposed; not immersed.
- DEPAU'PERATE, starved; stunted; undeveloped.
- DEPRESSED', as if pressed down or flattened; sunk below the level of the surrounding margin.
- DESCEND'ING, applied to a marginal veil when, in the young stage, its marginal attachment is below the level of its stipe-attachment; a ring formed from it is called superior.
- DES'ICCATE, DES'ICCATED, dried.
- DETER'MINATE, clearly defined; having a fixed, definite limit.
- DETERMINA'TION, assignment to the proper place in a classification or series.
- DIAGNO'SIS, scientific discrimination of any kind; a short distinctive description, as of a plant.
- DIAPH'ANOUS, permitting the passage of light; transparent; translucent.
- DICHOT'OMOUS, regularly dividing by pairs from below upward.
- DICHOT'OMY, a mode of branching by constant forking or dividing in pairs.
- DICOTYLE'DON, exogen; phenogam exogenous in growth, having two or more cotyledons and usually net-veined leaves; as maple, pine, clover, etc.
- DID'YMOUS, double; of two equal parts.
- DIFFEREN'TIATED, exhibiting differentiation.
- DIFFERENTIA'TION, (a) discriminating between by observing or describing the differences; (b) the evolutionary process or results by which originally indifferent parts or organs become differentiated or specialized in either form or function; specialization.
- DIF'FLUENT, readily dissolving.
- DIFORMED', DIF'FORM, irregular in form, not uniform.
- DIFFUSE', spreading widely, loosely and irregularly.
- DIG'ITATE, furnished with fingers; dividing like the fingers of the hand.
- DILA'TED, expanded; extended; enlarged.
- DILUTE', thinned, reduced in strength, as applied to solutions, colors, etc.
- DIMID'IATE, applied to lamellae that reach only half way to the stipe; applied to the pileus when it is semi-circular in outline or nearly so.
- DIMOR'PHIC, DIMOR'PHOUS, existing in two distinct forms.
- DIMOR'PHISM, the property of existing under two distinct forms.
- DISC, (a) any flat circular disk-like growth; (b) the central portion of the upper surface of a pileus; (c) the cup-shaped or otherwise variously shaped hymenial surface of a Discomycete.
- DIS'CIFORM, DIS'COID, DIS'COIDAL, of a circular, flat form; disk-shaped.
- DIS'COCARP, ascocarp in which the hymenium or disc lies exposed while the the asci are maturing, as in *Peziza*, *Morchella*, etc.
- DISCOMYCE'TES, a group of ascomycetous fungi in which the hymenium is exposed; the fruiting body is cupular, discoid, or clavate, and sometimes convoluted.
- DISCRETE', distinct; separate; not grown together; opposite to concrete.
- DISK, see disc.
- DISSEC'TED, cut deeply into many lobes or divisions.
- DISSEP'IMENTS, dividing walls; as between the pores in polypores.
- DISSOCIA'TION, separation.
- DIS'TAL, pertaining to the apex or outer extremity.
- DIS'TANT, far apart.
- DIS'TICHOUS, disposed in two rows.
- DIVAR'ICATE, separating at an obtuse angle.
- DOR'SAL, pertaining to the back; to the upper surface of the pileus.
- DORSIVEN'TRAL, said of a body having two nearly symmetrical but unlike sides facing in opposite directions.
- DOR'SUM, the back of any organ.
- DOWN, fine soft pubescence.
- E- or EX-, prefix signifying "destitute of," "outside of" or "away from."
- EBE'NEOUS, black like ebony.
- EBUR'NEOUS, ivory-white.
- ECCEN'TRIC, excentric.
- ECH'INATE, furnished with stiff bristles.
- ECHIN'ULATE, minutely echinate.
- ECOL'OGY, see oecology.
- ECTO-, prefix signifying "outside."
- ECTOBASID'IA, basidia placed on an exposed surface, not enclosed.
- EDEN'TATE, without teeth.
- EFFUSED', spread over the matrix without regular form.
- EFFU'SO-REFLEXED', effused with upper margin reflected from a pileus.
- EGG, a young plant before rupture of the volva, in phalloids, amanitas, etc.
- EGUTT'ULATE, not containing guttulae.
- ELLIP'SOID, a solid figure all plane sections of which are ellipses or circles.
- ELLIPSOI'DAL, shaped like an ellipsoid.

- ELLIP'TIC, ELLIP'TICAL, elongate-ovate; more than twice as long as broad; parallel sided in the middle and rounded at both ends.
- EMAR'GINATE, notched at the end; applied to a lamella which has a notch in its margin close to the stipe.
- EMBOSS'ED, in botany, projecting in the centre like the boss or umbo of a round shield.
- ENCRUST'ING, forming a crust-like coating.
- ENDEM'IC, peculiar to and characteristic of a locality or region; indigenous in some region and not elsewhere.
- ENDO-, ENTO-, prefix signifying "within," "inside."
- ENDOBASID'IA, basidia enclosed in a dehiscent or indehiscent conceptacle.
- ENDOCAU'LOUS, growing in the substance of herbaceous stems.
- EN'DOGEN, see monocotyledon.
- ENDOG'ENOUS, (a) produced within another body; (b) of or pertaining to the class of endogens.
- ENDOPERID'IUM, inner layer of the peridium.
- EN'DOPHYTE, a plant growing within an animal or another plant, usually as a parasite; entophyte.
- EN'DOSPORE, ENDOSPO'RIMUM, the inner coat of a spore.
- EN'DOSPORES, spores which are produced within a sporangium or spore-sac, as the ascospores.
- EN'SIFORM, sword-shaped.
- ENTIRE', having the edge without toothing or division; not divided into parts; continuous.
- ENTOMOG'ENOUS, growing upon or in insects.
- ENTOMOPH'YTOUS, growing upon or in insects or their remains.
- EN'TOPHYTE, endophyte.
- EPIDER'MIS, see cuticle.
- EPIG'ENOUS, growing upon the surface of a part; often limited to growth upon the upper surface, in distinction from hypogenous.
- EPIGAE'OUS, EPIGE'OUS, growing on or in the ground.
- EP'INASTY, that state of a growing dorsiventral organ in which the dorsal surface grows more actively than the ventral surface.
- EP'IPHRAGM, a delicate membrane closing the cup-like receptacle of the Nidulariacei.
- EPIPHYL'LOUS, growing upon a leaf; often limited to growth upon the upper surface, in distinction from hypophyllous.
- EP'IPHYTAL, EPIPHYT'IC, EPIPHYT'ICAL, of the nature of an epiphyte.
- EP'IPHYTE, growing upon the outside of another plant; either parasitic or not parasitic.
- EP'ISPORE, EPISPO'RIMUM, the outer coat of a spore; same as exosporium.
- EPITHE'CIUM, the layer sometimes formed above the asci by the conrescent tips of the paraphyses.
- EPIX'ILLOUS, growing upon wood.
- E'QUAL, applied to a stipe of uniform thickness; to lamellae of equal length.
- ERO'DED, having small irregular sinuses on the margin, as if knawed.
- EROSE', same as eroded.
- ERUM'PENT, prominent; originating beneath and bursting through the surface of the matrix.
- ES'CULENT, edible, eatable, not poisonous.
- E'TIOLATE, E'TIOLATED, blanched; whitened by exclusion of the sun's rays or by disease.
- EVANES'CENT, fleeting; vanishing; soon disappearing.
- E'VEN, having no depressions or elevations; not pitted, striate, etc; different from smooth or glabrous which see.
- EX-, prefix—see "E-."
- EXCEN'TRIC, not central; said of a stipe which is attached to the pileus at some point between the centre and the margin.
- EXCIP'ULUM, outer layer of an apothecium or cup developed as part of the receptacle.
- EXO-, prefix signifying "outside."
- EXOG'ENOUS, (a) produced on the outside of another body; (b) belonging to or characteristic of the class of exogens.
- EX'OGEN, see dicotyledon.
- EXOPERID'IUM, outer layer of the peridium.
- EX'OSPORES, spores which are free, not produced within a sporangium, as basidio-spores.
- EXOSPO'RIMUM, the outer coat of a spore; same as episporium.
- EXOT'IC, foreign, not native.
- EXPAN'DED, spread out, as a pileus from convex to plane.
- EX'PLANATE, flattened; expanded; applied usually to a part which has been rolled or folded.
- EXSER'TED, projecting; standing out.
- EXSICCA'TI, dried specimens; especially those published in sets.
- FAC'ULTATIVE-PAR'ASITE, an organism which normally lives throughout as a saprophyte, but which may also go through its course either wholly or in part as a parasite.
- FAC'ULTATIVE-SAP'ROPHYTE, an organism which normally is parasitic but which can vegetate at certain stages as a saprophyte.
- FAL'CATE, FAL'CIFORM, sickle-shaped.
- FARC'TATE, stuffed, which see.
- FARINA'CEOUS, covered as if with meal; mealy.
- FAR'INOSE, covered with a meal-like powder.
- FAS'CIATE, FAS'CIATED, (a) having broad parallel bands or stripes; (b) banded or compacted together; (c) exhibiting fasciation.
- FASCIA'TION, (a) a monstrous flattened expansion of the stem; (b) condition of being bound or compacted together.

- FAS'CICLE, FASCIC'ULUS, a close cluster; a small bundle.
- FASCIC'ULATE, growing in fascicles or clusters.
- FASTIG'iate, (a) with branches erect and close together; (b) sloping upward to a summit, point or edge.
- FAVOSE', resembling honeycomb.
- FENES'TRATE, having a window-like opening.
- FERRU'GINOUS, FERRUGIN'Eous, iron-rust colored.
- FI'BRILLAR, FI'BRILLATE, FI'BRILLOSE, FI'BRILLOUS, appearing to be covered or composed of minute fibres.
- FI'BROUS, covered with or composed of fibres.
- FI'BROUS-MYCE'LIUM, FI'BRILLOSE-MYCE'LIUM, elongated branching mycelial strands, formed by the union of hyphae.
- FIG'URATE, applied to a hymenium borne upon lamellae, spines, or other processes.
- FIL'AMENT, a separate fibre or fibril of any animal or vegetable tissue, as a filament of silk, wool, etc.
- FILAMEN'TOUS, like a thread; composed of threads or filaments.
- FILAMEN'TOUS MYCE'LIUM, FLOC'COSE MYCE'LIUM, mycelium of free hyphae which are at most loosely interwoven, but without forming bodies of definite shape and outline.
- FILA'CEOUS, FIL'IFORM, like a thread or filament.
- FIM'BRIATE, FIM'BRIATED, fringed.
- FIS'SILE, capable of being split, cleft or divided into layers.
- FIS'SURED, cleft or split.
- FIS'TULAR, FIS'TULOSE, tubular, hollow.
- FIXED, said of lamellae or spines not readily detached from the underlying tissue.
- FLABEL'LATE, FLABEL'LIFORM, fan-shaped.
- FLAC'CID, soft and limber; flabby; without firmness or elasticity.
- FLAG'ELLATE, FLAGEL'LIFORM, resembling in shape a whiplash.
- FLAVES'CENT, FLA'VOUS, yellow.
- FLESH, inner substance of a fungus-body as distinguished from the cortical and hymenial layers.
- FLESH'Y, succulent; composed of juicy cellular tissue.
- FLEX'UOSE, FLEX'UOUS, curved or bent alternately in opposite directions.
- FLOC'CI, (pl. of FLOC'CUS), flocks or tufts resembling wool.
- FLOC'COSE, wooly; composed of, or bearing flocci.
- FLOC'CULOSE, composed of or bearing minute flocci.
- FOLIA'CEOUS, leaf-like; bearing leaves.
- FO'VEATE, marked with pits or depressions.
- FOV'EOLATE, marked with minute pits or depressions.
- FREE, said of lamellae which are not attached to the stipe; said of any part not attached to another; of spores not inclosed in a special envelope.
- FRILL, same as armilla.
- FRONT, same as anterior, which see.
- FRUC'TIFICATION, (a) a fruit; any spore-bearing, spore-containing, or seed-containing structure and its spores or seeds; (b) the process of development of a fruit and its attendant parts.
- FUGA'CIOUS, fleeting; transitory; falling or fading early.
- FU'GITIVE, quickly disappearing; evanescent.
- FULIGIN'Eous, FULIG'INOUS, very dark opaque brown; smoky; sooty.
- FULVES'CENT, somewhat tawny.
- FUL'VOUS, tawny, reddish yellow.
- FU'MOSE, FU'MOUS, smoke-colored, fuliginous.
- FUN'GOID, of, or pertaining to fungi.
- FUNGOL'OGY, mycology.
- FUN'GUS, (pl. FUN'GI), a thallophyte characterized by the absence of chlorophyll and deriving its sustenance from living or dead organic matter.
- FU'NICLE, funiculus.
- FUNIC'ULAR, having the character of a funicle or a small cord.
- FUNIC'ULATE, having a funicle.
- FUNIC'ULUS, in Nidulariaceae, the cord of hypae attaching a peridiolum to the inner wall of the peridium.
- FUR'CATE, forked; divided into branches.
- FURFURA'CEOUS, covered with bran-like particles, scurfy.
- FUSCES'CENT, somewhat fuscous.
- FUS'COUS, of a dark, dusky, swarthy color; brown; brown tinged with gray.
- FU'SIFORM, FU'SOID, tapering from the middle to both ends; spindle-shaped.
- GAMOGEN'ESIS, sexual reproduction.
- GASTEROMYCE'TES, GAS'TROMYCE'TES, a group of Basidiomycetes in which the hymenium is enclosed in a sack-like envelope called the peridium.
- GELATINA'TION, GELATINISA'TION, transformation into a gelatinous tissue.
- GELAT'INOUS, jelly-like.
- GENER'IC, (a) pertaining to, of the nature of, or forming a mark of a genus; (b) having the rank or classificatory value of a genus.
- GENET'IC, of or pertaining to origin or mode of production.
- GE'NUS, (pl. GEN'ERA), a classificatory group ranking next above a species containing one or more species.
- GEOTROP'IC, turning or inclining toward the earth.
- GIB'BOUS, in the form of a swelling; applied to a pileus which is more swollen or convex on one side than the other.
- GILL, lamella.
- GIL'VOUS, isabelline; color of sole leather.

- GLA'BROUS, smooth; applied to a surface which is destitute of pubescence; a surface may be glabrous or smooth and not even, or vice versa.
- GLANDS, GLAN'DULES, moist or sticky dots resembling the glands on the epidermis of phenogams.
- GLAN'DULAR, bearing glands.
- GLAU'COUS, covered with pale green bloom or very fine white powder easily rubbed off.
- GLE'BA, in Gastromycetes, spore-bearing tissue composed of chambers lined with the hymenium and enclosed by the sack-like peridium, as in puff balls, etc.; in phalloids the peridium or volva ruptures and the gleba is carried up on the stipe-like or clathrate receptacle.
- GLO'BOSE, GLOB'ULAR, GLOB'ULOSE, nearly spherical.
- GLU'TEN, applied to a tenaceous viscous substance resembling gluten found on the surface of some mushrooms.
- GLU'TINOUS, GLU'TINOSE, covered with a sticky exudation; viscous; glue-like.
- GONID'IUM, same as conidium.
- GRAN'ULAR, GRAN'ULATE, GRAN'ULOSE, covered with or composed of granules.
- GRAN'ULE, (a) a little grain; a fine particle; (b) a synonym of sporule.
- GREGA'RIOUS, growing in groups, but not in a tufted manner.
- GRU'MOUS, clotted; as the contents of some cells.
- GUT'TATE, spotted as if with drops of something colored.
- GUTT'ULA, (pl. GUTT'ULAE), a small drop or drop-like particle; the oil-globule in some spores resembling a nucleus.
- GUTT'ULATE, finely guttate; also, containing or composed of fine drops or drop-like particles; said of spores containing an oily nucleus-like globule or guttula.
- GYMNOCAR'POUS, having the hymenium exposed when the spores are maturing.
- GYM'NOSPERMS, trees or shrubs mostly evergreen and resinous having the seeds naked, not inclosed in a seed vessel; as conifers, etc.
- GY'RATE, GY'ROSE, folded and waved; having folds resembling the convolutions of the brain.
- HAB'ITAT, the natural place of growth of a species.
- HAUSTO'RIMUM, (pl. HAUSTO'RIA), special branch of filamentous mycelium which serves as an organ of adhesion and suction.
- HEMIANGIOCAR'POUS, partly angiocarpous as those agarics where the hymenium is at first enclosed by a veil or otherwise and later becomes exposed.
- HERBA'CEOUS, said of phenogamous plants which perish annually down to (sometimes including) the root.
- HERBA'RIMUM, a collection of dried plants arranged systematically.
- HERBIC'OLOUS, growing on herbageous plants.
- HETEROGE'NEOUS, of a structure which is different from adjacent ones.
- HIBERNAC'ULUM, (pl. HIBERNAC'ULA), applied to bodies which are the forms in which certain fungi (e. g. Typhulae) pass the winter.
- HIRSUTE' covered thickly with rather long stiff hairs.
- HIR'TO-VER'RUCOSE, bearing hairs grouped in wart-like masses.
- HISPID, beset with stiff bristles.
- HISTOGENET'IC, relating to the formation of tissue.
- HOAR'Y, covered with short dense grayish-white hairs; canescent.
- HOLO-, a prefix signifying 'entire,' 'whole.'
- HOMOGE'NEOUS, alike in structure.
- HOMOL'OGOUS, having the same relative position, proportion, value or structure; having correspondence or likeness.
- HOMOL'OGY, correspondence in structure or morphological nature.
- HOST, the name given to any plant or animal supporting a parasitic fungus.
- HU'MUS, vegetable mold; woody fibre in a state of decay.
- HY'ALINE, colorless; transparent.
- HYBERNAC'ULUM, hibernaculum.
- HYGROMET'RIC, readily absorbing and retaining moisture.
- HYGROPHANE'ITY, state of being hygrophanous.
- HYGROPH'ANOUS, looking watery when moist, opaque when dry.
- HYGROSCOP'IC, having the property of absorbing moisture from the atmosphere; sensitive to moisture.
- HYME'NIUM, aggregation of spore-mother-cells, with or without sterile cells, in a continuous layer upon a sporophore; sporogenous layer; hymenial layer.
- HY'MENOMYCE'TES, a group of Basidiomycetes having the hymenium on the free exposed surface of the sporophore.
- HY'MENOPHORE, HYMENOPH'ORUM, portion of a sporophore which bears the hymenium.
- HY'PHA, (pl. HY'PHAE), the elementary filament or thread of a fungus; a cylindric thread-like branched body developing by apical growth, and usually becoming transversely septate.
- HY'PHAL, of or pertaining to a hypha.
- HYPOCRATER'IFORM, having the shape of a cylindrical cup the margin of which turns outward; salver shaped.
- HYPOGAE'OUS, HYPOGE'AL, HYPOGE'OUS, growing under ground.
- HYPOG'ENOUS, growing on the under surface.
- HY'PONASTY, that state of a growing dorsi-ventral organ in which the ventral surface grows more actively than the dorsal surface.

- HYPOPHYL'LUS, growing on the under side of a leaf.
- HYPOTHE'CIUM, layer of hyphal tissue immediately beneath a hymenium.
- IM'BRICATE, IM'BRICATED, overlapping like the shingles of a roof.
- IMMAR'GINATE, without a well defined margin.
- IMMERSED', (a) sunk into the matrix; (b) originating beneath the surface of the matrix or of the ground; (c) growing wholly under water.
- IMPER'FORATE, without any aperture.
- INCANES'CENT, somewhat or slightly canescent.
- INCAR'NATE, flesh-colored.
- INCISED', as if cut into.
- INCRAS'SATE, thickened.
- INCRUS'TING, forming a crust-like coating.
- INDEHIS'CENT, applied to a peridium which does not open spontaneously at maturity, the spores within it becoming freed by its decay.
- INDIF'FERENT, primitive, homogeneous, not developed into parts or organs of different structure or function.
- INDIG'ENOUS, native; not foreign.
- IN'DURATED, hardened.
- INDU'SIUM, in certain phalloids, an appendage or veil hanging from the apex of the stipe beneath the pileus.
- INFE'RIOR, below; on under surface; applied to a ring formed from a veil which in the young state has its stipe-attachment below the level of its marginal attachment.
- INFLA'TED, swollen like a bladder.
- INFLEXED', bent inward.
- INFUNDIB'ULIFORM, funnel-shaped.
- IN'NATE, originating within the substance of the plant or matrix; appearing to be within or blended with the substance of a part.
- INNA'TO-SES'SILE, without a stem and somewhat immersed; i. e. with the base of the receptacle beneath the surface of matrix.
- INORGAN'IC, not produced by vital processes; not organic.
- INSERTED, attached; growing immediately from the matrix like a graft from its stock, (not rooting).
- INSITI'TIOUS, inserted.
- INTER-, prefix meaning 'between' or 'among' or 'during.'
- INTER'CALATED, INTER'CALARY, interposed; inserted between.
- INTERCELL'ULAR, situated between the cells.
- INTERRUPT'ED, said of any surface or series the continuity of which is broken.
- INTER'STICES, spaces between any surfaces or things.
- INTRA-, prefix meaning 'within.'
- INTRACELL'ULAR, situated within a cell or cells.
- INTRALAM'ELLAR, situated within or between the plates of the lamella.
- INTRODUCED', applied to plants brought from another country and growing spontaneously.
- INVAG'INATED, sheathed.
- IN'VOLUTE, rolled inward.
- ISABEL'LINE, color of sole-leather, of soiled linen; alutaceous.
- ISODIAMET'RIC, having the diameters equal.
- LA'BIATE, said of an aperture with distinct lip-like borders.
- LABYRIN'THINE, LABYRIN'THIFORM, characterized by intricate and sinuous lines; like a labyrinth.
- LAC'CATE, as if varnished or covered with a coat like sealing wax.
- LAC'ERATE, LAC'ERATED, as if torn.
- LACIN'IATE, slashed; deeply cut by narrow incisions, more regular and larger than fimbriate.
- LACU'NA, (pl. LACU'NAE), a pit or hollow; a gap; a vacancy caused by the omission, loss or obliteration of something necessary to continuity or completeness.
- LACU'NOSE, LACU'NOUS, bearing scattered, irregular, broadish, but shallow excavations; having or full of lacunae.
- LACU'NULOSE, minutely lacunose.
- LAMEL'LA, (pl. LAMEL'LAE), gill; vertical plate radiating from the stipe on the under surface of a pileus.
- LA'NATE, wooly; covered with a wool-like pubescence.
- LAN'CEOLATE, lance-shaped; many times longer than broad and tapering to one or both ends.
- LAT'ERAL, attached to or by one side.
- LATERIC'EUS, LATERIT'IOUS, brick-colored.
- LA'TEX, thick milky juice.
- LATICIF'EROUS, milk bearing.
- LAT'TICED, formed by interlacing and crossing lines or columns which leave open spaces between.
- LENTIC'ULAR, LEN'TIFORM, shaped like a double convex lens; lentil-shaped.
- LEP'IDOTE, covered with scurfy scales or scaly spots.
- LEV'IGATE, having a polished surface.
- LIG'NATILE, growing on wood.
- LIG'NEOUS, of woody texture.
- LIG'ULATE, flattened like a strap.
- LING'UIFORM, LING'ULATE, tongue shaped.
- LIV'ID, bluish-black, like the black and blue of a bruise.
- LOBED, LO'BATE, having divisions which are large and rounded.
- LOB'ULATE, having small lobes.
- LOC'ULAR, LOC'ULATE, LOC'ULOSE, LOC'ULOUS, divided by internal partitions into loculi or cells.
- LOC'ULUS, (pl. LOC'ULI), a little chamber or cell.

- LU'CID, bright, clear, transparent.
- LU'MEN, the internal cavity or space in a cell or any tubular organ.
- LU'RID, sordid; dull; dingy; dirty brownish.
- LU'TEOUS, (a) egg-yellow; gold-yellow. (b) like mud or clay.
- LUTES'CENT, yellowish.
- MACRO-, in composition, 'large' or 'long.'
- MACROSCOP'IC, MEGASCOP'IC, visible to the naked eye; visible without the aid of a powerful magnifying instrument.
- MAC'ULATE, MAC'ULAR, MAC'ULOSE, spotted.
- MAM'MIFORM, breast-shaped.
- MAR'GINAL VEIL, see 'veil.'
- MAR'GINATE, having a well defined border.
- MAST, the fruit of the oak and beech and other forest trees; acorns or nuts collectively.
- MA'TRIX, the substance upon or in which a fungus grows.
- ME'DIAL, applied to ring when situated at about the middle of stipe.
- MEDUL'LA, pith; marrow; kernel; inner substance as distinguished from outer or cortical layer or layers.
- MED'ULLARY, composed of or pertaining to a medulla.
- MEGA-, prefix signifying 'great.'
- MEMBRANA'CEOUS, MEM'BRANOUS, having the character or appearance of membrane; thin, rather soft, and pliable.
- MERIS'MOID, applied to pileus which is sub-divided into many smaller pilei.
- MES'OPOD, plant having a central stipe.
- MICA'CEOUS, covered with glistening mica-like particles.
- MI'CRON, MI'KRON, microscopic unit of measure; 1-1000 of a millimeter; nearly .00004 inch; to convert inches to microns approximately, divide by .00004.
- MIN'iate, vermilion-colored; of a bright vivid red color.
- MI'TRATE, MIT'RIFORM, mitre-shaped; bonnet-shaped.
- MOLD, MOULD, (a) fine, soft earth; (b) a general term to describe certain fungus growths of a low type.
- MONIL'IFORM, like a string of beads.
- MONOCOTYLE'DON, endogen; phenogam having a single cotyledon, endogenous growth, and mostly parallel-veined leaves; as the palm, Indian corn, etc.
- MONOPO'DIAL, having an axis of growth which continues to extend at the apex in the direction of previous growth, while lateral structures of the like kind are produced beneath it in acropetal succession.
- MONOS'TICHOUS, arranged in one row.
- MON'STER, MONSTROS'ITY, a plant or animal having any marked abnormal development in form.
- MON'STROUS, of unnatural formation; deviating greatly from the natural form or structure; (has no reference to size).
- MORPHOLOG'IC, MORPHOLOG'ICAL, of or pertaining to morphology.
- MORPHOL'OGY, the science of organic form; the science of outer form and internal structure.
- MOTHER-CELL, a cell from which another is derived.
- MOV'ABLE, applied to a ring which has separated from the stipe and can be moved up and down.
- MUCED'INOUS, having the character of or resembling mould or mildew.
- MU'CID, (a) musty, mouldy; (b) slimy.
- MUCILAG'INOUS, MU'COUS, slimy.
- MU'CRONATE, tipped with an abrupt short sharp point.
- MULTI-, in composition, 'many.'
- MUL'TIFID, many times divided.
- MULTIPAR'TITE, many parted.
- MULTISEP'TATE, divided by many partitions.
- MU'RICATE, rough with short hard points.
- MURIC'ULATE, finely muricate.
- MU'RIFORM, resembling the arrangement of the bricks in the walls of a house; said of spores having septa at right angles to each other.
- MU'RINE, MU'RINOUS, mouse-colored.
- MUSH'ROOM, see toadstool.
- MU'TUALISM, symbiosis of two organisms living together and mutually helping and supporting each other.
- MYC, MYCET, MYCETO, MYCO, prefixes signifying 'fungus.'
- MYCE'LIAL, of or pertaining to mycelium.
- MYCE'LIIUM, vegetative portion of the thallus of fungi composed of one or more hyphae.
- MYCE'LIOID, like mycelium.
- MYC'ELOID, like a fungus.
- MYCETOL'OGY, mycology.
- MYCOLOG'ICAL, relating to fungi.
- MYCOL'OGIST, one who is versed in mycology.
- MYCOL'OGY, the science of fungi, their structure, classification, etc.
- MYCOPH'AGIST, one who eats fungi.
- MYCOPH'AGY, the eating of fungi.
- MYCORHI'ZA, a composite organ formed by the symbiosis of the rootlets of certain phenogams, especially of the cupuliferae and some other forest trees, and a fungus-mycelium which invests and penetrates them; it is believed that the fungus not only derives nourishment from the tree but that it assists the tree in absorbing nourishment from the soil; fungi comprised in the oomycetes, gasteromycetes, hymenomycetes and pyrenomycetes may be symbionts of a mycorhiza, but are capable of an independent existence.

- NA'KED, bare; without covering of any kind, as of an enveloping membrane, pruinose, farinaceous or furfuraceous particles, tomentum, fragments of volva or veil, etc.
- NAP'IFORM, turnip-shaped.
- NAS'CENT, in the earliest rudimentary condition; beginning to exist or to grow.
- NATURALIZED, said of a plant of foreign origin, which thrives as if indigenous.
- NAVIC'ULAR, boat-shaped.
- NIGRES'CENT, NIG'RICANT, becoming black; also blackish, dusky, fuscous.
- NIT'ID, NIT'IDUS, lustrous, shining, polished.
- NI'VEOUS, snow-white.
- NOD'ULE, a little knot or lump.
- NOD'ULOSE, NOD'ULOUS, bearing nodules.
- NON-, not; prefix giving a negative sense to words.
- NU'CLEATE, NU'CLEATED, having a nucleus or nuclei.
- NUCLE'OLUS, (pl. NUCLE'OLI), sharply defined point often seen in the nucleus.
- NU'CLEUS, (pl. NU'CLEI), (a) a central mass or kernel; (b) a spherical or ellipsoidal mass in the protoplasm of a cell denser and more highly refractive than the rest of the protoplasm, functionally the most important portion of a cell, for in it the process of cell-division begins; (c) the name has been sometimes improperly applied by systematists to the oil-globules or guttulae and the vacuoles within some spores.
- OB-, in composition, 'inversely.'
- OBCON'IC, OBCON'ICAL, inversely conical.
- OBCOR'DATE, inversely cordate.
- OBESE', stout, plump.
- OB'LIGATE-PARASITE, can only grow as a parasite; see facultative parasite.
- OB'LIGATE-SAPROPHYTE, can only grow as a saprophyte; see facultative saprophyte.
- OB'LONG, two or three times longer than broad with nearly parallel sides.
- OBO'VATE, inversely ovate, having the broad end upward or toward the apex.
- OBPYR'IFORM, inversely pear-shaped.
- OB'SOLETE, indistinct; very imperfectly developed; hardly perceptible.
- OBTUSE', blunt or rounded at the apex.
- OCHRA'CEOUS, O'CHEROUS, O'CHREOUS, O'CHROID, O'CHRY, ochre yellow, light yellow with a tinge of brown.
- OECOL'OGY, the science of animal and vegetable economy; the study of the phenomena of the life history of organisms, in their reciprocal and individual relations; thus parasitism comes under the scope of oecology.
- OID, a termination signifying 'like'; as pezizoid, peziza-like.
- OLEAG'INOUS, oily or oil-like.
- OLIVA'CEOUS, olive-green.
- OPAQUE', OPAKE', mostly used in the sense of dull, not shining.
- OPER'CULUM, a lid-like cover.
- ORBIC'ULAR, round; spherical.
- ORGAN'IC, pertaining to either living or dead animal or vegetable organisms.
- OS'MOSE, the impulse or tendency of fluids to pass through membranes and mix or become diffused through each other.
- OSMO'SIS, the diffusion of fluids through membranes; see osmose.
- OSMOT'IC, of or pertaining to or characterized by osmose.
- OS'TIOLE, OSTI'OLUM, the aperture in the top of a perithecium through which spores are discharged.
- O'VATE, having a figure the shape of a longitudinal section of an egg.
- O'VOID, egg-shaped—used to describe solids.
- PALES'CENT, inclining to paleness; becoming pallid.
- PAL'LID, of a pale, indefinite color.
- PAL'UDINE, PALU'DINOUS, PAL'UDOSE, PALUS'TRINE, growing in marshes or swamps.
- PAPIL'IONA'CEOUS, variegated; mottled; marked with different colors; as the lamellae of some species of *Panaeolus* mottled with black spores.
- PAPIL'LA, (pl. PAPIL'LAE), a small nipple-shaped elevation.
- PAP'ILLATE, bearing one or more papillae.
- PAPIL'LIFORM, PAPIL'LAIFORM, shaped like a papilla.
- PAPYRA'CEOUS, like paper.
- PARAPH'YSIS, (pl. PARAPH'YSES), slender, thread-like bodies growing with the asci; sterile club-shaped cells growing in the hymenium with the basidia.
- PAR'ASITE, a plant growing on or in another living body from which it derives all or part of its nourishment.
- PARASIT'IC, growing on or in and deriving its sustenance from a living plant or animal.
- PAREN'CHYMA, the fundamental cellular tissue of plants composed of thin walled approximately isodiametric cells; absent in fungi; see pseudoparenchyma and prosenchyma.
- PARENCHYM'ATOUS, pertaining to, containing, consisting of or resembling parenchyma.
- PA'RIES, (pl. PARI'ETES), wall of a cavity or capsule.
- PARI'ETAL, pertaining to or arising from a wall.
- PAR'TIAL VEIL, marginal veil.
- PAT'ELLATE, PATEL'LIFORM, shaped like a dish.
- PEC'TINATE, having resemblance to the teeth of a comb.
- PED'ICEL, any short, very small, stem-like stalk.

PED'ICELLATE, having a pedicel, or tiny foot-stalk.

PEL'LICLE, see cuticle.

PELLU'CID, admitting the passage of light; transparent; translucent.

PEL'TATE, formed like a shield and fixed to the stalk by the centre or by some point distinctly within the margin.

PEN'CILED, marked with fine lines.

PEN'DULOUS, hanging down.

PEN'ICILLATE, pencil-shaped; bearing a tuft of soft hairs resembling a camel's hair pencil.

PEREN'NIAL, continuing growth from year to year.

PERGAME'NEOUS, like parchment.

PERICLI'NAL, said of cell walls or any lines when parallel with the outer surface.

PERIDI'OLUM, a secondary or interior peridium containing a hymenium.

PERID'IUM, (pl. PERID'IA), the outer enveloping coat of the sporophore in angiocarpous fungi, as in puff-balls.

PERIPH'ERAL, of, belonging to, or situated on the periphery.

PERIPH'ERY, the exterior surface of any body.

PER'ISTOME, toothed or variously shaped ring around the mouth or orifice for discharge of spores in a peridium.

PERITHE'CIUM, (pl. PERITHE'CIA), cup-shaped ascocarp with the margin incurved so as to form a narrow mouthed cavity; the case or hollow shell which contains the spores.

PER'ONATE, booted; said of the stipe when it has a boot-like or stocking-like covering.

PERSIS'TENT, enduring; continuing without withering, decaying or falling off.

PER'SONATE, masked or disguised in any way.

PER'VIOUS, forming an open tube-like passage.

PEZ'IZOID, resembling a peziza.

FHAE'NOGAM, PHAN'EROGAM, PHE'NOGAM, a flowering plant, producing true seeds.

PHAENOG'AMOUS, PHANEROG'AMOUS, PHENOG'AMOUS, producing true flowers and seeds.

PHYLOGENET'IC, PHYLOGEN'IC, of or pertaining to phylogeny.

PHYLOG'ENY, the history of the evolution of a species or group; tribal history; ancestral development.

PI'LEATE, having a cap or pileus.

PILE'OLUS, (pl. PILEOLI), a little pileus; used especially where there are several from the same stalk.

PI'LEUS, (pl. PI'LEI), the umbrella-like cap or analogous receptacle of many fungi, as in toadstools morels, etc.; it may be stipitate, sessile, dimidiate, regular, or irregular in form.

PILIF'EROUS, PILIG'EROUS PI'LOSE, PI'LOUS, covered with hair, especially with fine or soft hair.

PIP-SHAPED, shape of an apple seed.

PIR'IFORM, pear-shaped.

PI'SIFORM, pea-shaped.

PITH, central stuffing in some stipes.

PIT'TED, covered with pits or small depressions.

PLACEN'TIFORM, in the form of a thickened circular disk depressed in the middle both above and below.

PLANE, having a flat surface.

PLI'CATE, folded like a fan; plaited.

PLUM'BEOUS, lead-colored.

PLU'MOSE, PLU'MOUS, feathery or feathered.

PLURI-, prefixed has the significance of many.

POC'ULIFORM, cup-shaped.

POLY-, a prefix meaning 'many.'

POLYG'ONAL, having many angles.

POLYMOR'PHISM, POL'YMORPHY, existence in, or exhibition by the same species or group of different types of structure;

POLYMOR'PHOUS, varying much in appearance form or structure in the same species or group; characterized by polymorphism.

POLYS'TICHOUS, arranged in many rows.

PORE, in Pyrenomycetes, same as ostiole; in Hymenomycetes, same as tubulus or tube, as the tubules of poly-pores; also the mouth of a tubulus.

PO'ROSE, PO'ROUS, bearing pores or tubules; pierced with small holes.

PORRECT', extended forward; stretched forth horizontally.

POSTE'RIOR, denotes a position on under side of the pileus adjacent to the stipe; the end of a lamella next the stipe is the posterior end.

PREMORSE', having the apex irregularly truncate as if bitten or broken off.

PRIMOR'DIAL, first formed; existing from the beginning.

PRIMOR'DIUM, first beginning of any structure.

PROC'ESS, an outgrowth or projection from a surface.

PROCUM'BENT, prostrate; unable to support itself, therefore lying on the ground.

PRODUCED', drawn out; elongated; extended; protrusive or protuberant.

PROJEC'TION, the length of the upper surface of a dimidiate pileus from the base to a point at the middle of the margin.

PROSEN'CHYMA, the fibro-vascular tissue forming the framework of plants composed of much elongated cells pointed at the ends; not found in fungi.

PROLIF'EROUS, applied to an organ which gives rise to secondary ones of the same kind.

PRO'TEAN, exceedingly variable.

PRO'TEID, albumenoid.

PROTOBASID'IUM, basidium divided by transverse septa into four cells, each giving rise to a spore from a laterally inserted sterigma, or a basidium divided longitudinally by septa intersecting each other at right angles into four cells, each cell terminating in a long tubular sterigma.

PRO'TOPLASM, the nitrogenous fluid of variable composition found in living cells; it is the vital substance into which all food is assimilated, and from which all parts of the plant are formed.

PROX'IMAL, pertaining to the base or extremity of attachment.

PRU'INATE, PRU'INOSE, covered with a bloom or powder so as to appear as if frosted.

PRUN'IFORM, plum-shaped.

PSEUDO, prefix signifying 'false' or 'spurious.'

PSEUDO-PAREN'CHYMA, a fungus-tissue, formed of closely woven and felted hyphal threads, which on section has the appearance of the cellular structure of true parenchyma.

PUBES'CENCE, general term to describe hairyness; specifically, covered with short soft downy hairs.

PUBES'CENT, covered with short soft downy hairs; hairy.

PULLULA'TION, a mode of cell multiplication in which a cell forms a protuberance on one side which enlarges to size of parent cell and is cut off from it by a dividing wall; sprouting.

PULVERA'CEOUS, PULVER'ULENT, covered as if with powder or dust.

PUL'VINATE, cushion-shaped.

PUNC'TATE, having dots scattered over the surface.

PUNC'TIFORM, like a point or dot.

PUS'TULAR, PUS'TULATE, having low elevations shaped like blisters or pustules.

PUTRES'CENT, soon decaying.

PYR'IFORM, pear-shaped.

QUAD-, QUADRI-, prefix meaning 'four.'

QUAD'RATE, square; sometimes used to mean 'of four equal parts.'

QUATER'NATE, arranged in groups of four.

RA'DIATE, RA'DIATING, arranged like the spokes of a wheel.

RAD'ICATING, rooting; having root-like strands which penetrate the matrix.

RA'MEAL, RA'MEOUS, growing on twigs or branches.

RAMIC'ULOUS, growing on branches.

RAM'IFICATION, branching, or the manner of branching.

RAM'IFY, to form branches.

RA'MOSE, RA'MOUS, having many small branches.

RAPH'IDES, (pl. of RA'PHIS), long slender needle-like crystals pointed at both ends, sometimes found within the tissues of plants.

RECEP'TACLE, RECEPTAC'ULUM, term of varying signification, usually implying a hollowed out body containing other bodies; (a) same as stroma; (b) same as sporophore; (c) in Phalloids, the stipe, stipe and pileus,, or the clathrate body which supports the gleba.

REFLEXED', REFLEC'TED, turned or bent back.

REMOTE', applied to lamellae where their posterior extremities are distant from the stipe.

REN'IFORM, kidney-shaped.

REPAND', (a) bent or turned up or back. (b) having a slightly undulating or sinuous margin.

REP'PLICATE, folded back upon itself, as when the margin of a cup turns outwards and downwards.

RESU'PINATE, attached to the matrix by the back, the hymenium facing outward.

RETIC'ULATE, RE'TIFORM, marked with crossed lines like the meshes of a net.

REV'OLUTE, rolled backward or upward.

RHI'ZOCTONES, delicate, web-like ramifying strands of loosely united hyphae sometimes found investing and penetrating the young roots of trees, eventually causing death of the tree.

RHI'ZINES, RHI'ZOIDS, delicate filiform hyphal branches which serve to attach the sporophore to the substratum and supply nourishment.

RI'MOSE, RI'MOUS, covered with cracks.

RHI'ZOMORPHS, long, branching or anastomosing, rigid, root-like cords of mycelium with a dark or black exterior, often growing between the bark and timber or about and penetrating the roots of dead and living trees, produced by *Agaricus melleus* and various other fungi.

RIM'ULOSE, RIM'ULOUS, covered with small cracks.

RIND, cortex.

RING, annulus.

RI'VOSE, marked with furrows which do not run in parallel directions.

RIV'ULOSE, marked with lines like the rivers on a map.

ROOT'ING, see 'radicating.'

ROS'TRATE, beaked.

ROTUND', round or nearly so.

RUBES'CENT, tending to a red color.

RUBIG'INOUS, iron-rust colored; ferrugineous.

RUFES'CENT, tending to rufous or dull red color.

RUF'FLED, very strongly undulate.

RU'FOUS, dull red, Venetian red.

RU'GOSE, wrinkled.

RU'GULOSE, minutely rugose.

RUN'CINATE, irregularly saw-toothed, the divisions or teeth hooked backward.

SAB'ULINE, SAB'ULOSE, growing in sandy places.

SAC'CATE, in the form of a sack or pouch.

SAC'CHARINE, of or resembling sugar; covered with shining grains like those of sugar.

SAC'CULE, SAC'CULUS, a small sac or pouch.

SANGUIN'EUS, blood-colored.

SAP'ID, agreeable to the taste.

SAPROG'ENOUS, growing in decaying or decomposing animal or vegetable matter.

SAPROPHYT'IC, living upon and deriving its sustenance from dead organic matter.

SAP'ROPHYTE, a plant that lives on decaying vegetable or animal matter.

SCA'BRATE, SCA'BROUS, rough, rugged; especially, rough to the touch.

SCALAR'IFORM, in the form of a ladder.

SCAPH'OID, boat-shaped.

SCA'RIOSE, SCA'RIOUS, thin, dry and membranaceous.

SCIS'SILE, capable of being easily split or cleft; said of lamellae which can easily be split into two plates.

SCLERIT'IC, SCLE'ROID, SCLE'ROSE, SCLE'ROSED, having a hard texture.

SCLERO'TIOID, resembling a sclerotium.

SCLERO'TIUM, (pl. SCLERO'TIA), hard, black, compact, tuber-like body, which is the resting stage of certain fungi, as in *Peziza tuberosa*; it remains dormant for a time and then sends up shoots which develop into sporophores at the expense of the reserve material.

SCO'BIFORM, resembling sawdust.

SCROBIC'ULATE, pitted.

SCU'TELLATE, shaped like a plate or platter.

SEMI-, prefix meaning 'half' or 'partial.'

SEP'ARABLE, capable of being detached.

SEP'ARATING, becoming detached, as lamellae from the stipe, or resupinate fungi from the matrix.

SEP'TATE, having partitions.

SEP'TUM, (pl. SEP'TA), partition.

SE'RIATE, arranged in rows.

SERIC'EUS, silky.

SER'RATE, having marginal teeth shaped like saw teeth.

SER'RULATE, minutely serrate.

SES'SILE, attached by the base; having no stipe or stalk.

SE'TA, (pl. SE'TAE), a bristle.

SETA'CEOUS, SETIG'EROUS, SE'TOSE, beset with bristles.

SIG'MOID, said of an elongated spore having the ends bent slightly in opposite directions; s-shaped.

SIN'UATE, SIN'UOSE, SIN'UOUS, tortuous; serpentine; turning or winding in and out; applied to an edge the outline of which is alternately concave and convex; a sinuate lamella has a sudden wave or sinus in its edge near the stipe.

SI'NUS, a rounded inward curve between two projecting lobes.

SMOOTH, glabrous; destitute of any kind of pubescence; a surface may be uneven and yet smooth.

SOL'ITARY, growing singly.

SOR'DID, of a dingy, dirty hue.

SPADIC'EUS, date-brown, duller and darker than bay-brown.

SPATH'ULATE, oblong or rounded and flattened at the top, with a long narrow attenuate base.

SPE'CIES, an individual or collectively those individuals which differ specifically from all other members of a genus and which do not differ from each other except within narrow limits of variability, and which produce by propagation other individuals of the same kind.

SPECIF'IC, of, pertaining to, constituting, peculiar to, characteristic of, diagnostic of, designating species or a species; not generic; not of wider application than to a species.

SPHAG'NUM, peat or bog-moss.

SPHER'ICAL, SPHE'ROID, of the shape of a ball or globe, or nearly so.

SPIC'ULAR, SPIC'ULATE, SPIC'ULOUS, covered with spicules.

SPIC'ULE, a sharp-pointed body resembling a needle; a little spike.

SPORAN'GIOPHORE, special mycelial branch bearing a sporangium.

SPORAN'GIUM, (pl. SPORAN'GIA), sac producing spores endogenously.

SPORE, the reproductive body of cryptogams analogous to the seed of phenogams; the terms spores, sporidia, sporules and conidia have been applied somewhat indiscriminately to all spore-bodies; it has been recommended by some authorities and accepted by Saccardo to limit the term spore to the naked spore produced on a basidium, sporidium to the spore produced in an ascus, sporule to the spore of imperfect fungi, where enclosed in a perithecium, conidium to the spore of imperfect fungi, where not enclosed in a perithecium or ascus; according to these limitations the terms spermatium, stylospore, clinospore are merged in sporule.

SPORIDIF'ERA, a class of fungi in which the spores are enclosed in asci.

SPORIDIF'EROUS, SPORIDIIF'EROUS, (a) bearing sporidia; (b) applied to a fungus of the class Sporidifera.

SPORID'IUM, (pl. SPORID'IA), an ascospore or endospore; see spore.

SPORIF'ERA, a class of fungi in which the spores are free, naked, or soon exposed.

SPORIF'EROUS, (a) bearing spores. (b) applied to a fungus of the class Sporifera.

SPO'ROCARP, in Ascomycetes, the entire fruit, composed of the ascophore and the asci.

SPOROG'ENOUS, producing spores.

SPO'ROPHORE, branch or portion of thallus which bears spores or spore-mother-cells; said to be simple or filamentous when consisting of a single hypha or branch of a hypha, compound, when formed by the cohesion of the ramifications of separate hyphal branches; (the common mushroom is a compound sporophore).

SPO'ROPHYTE, spore plant; cryptogam.

SPORT, an animal or plant or any part of one that varies suddenly or singularly from the normal type of structure, and is usually of transient character, or not perpetuated; not so much deformed as 'monster.'

SPO'RULE, see under 'spore.'

SPU'RIOUS, false.

SQUA'MA, (pl. SQUA'MAE), a scale or scale-like appendage.

SQUA'MOSE,, SQUA'MOUS, covered with appressed scales.

SQUAM'ULA, SQUAM'ULE, a small squama.

SQUAM'ULOSE, covered with minute scales.

SQUAR'ROSE, rough with spreading processes.

STALK, stipe; any stem-like supporting organ.

STEL'LATE, star-shaped.

STERIG'MA, (pl. STERIG'MATA), stalk-like branch of a basidium bearing a spore.

STER'ILE, not fertile; producing no spores.

STIPE, stalk of a mushroom.

STIP'ITATE, having a stipe.

STO'MA, (pl. STO'MATA). (a) a mouth or aperture; (b) little orifices in the epidermis of leaves, etc., opening into air-cavities or intercellular spaces.

STRAIGHT, applied to margin of pileus when not involute.

STRAMIN'EOUS, straw colored.

STRA'TOSE, arranged in distinct layers or strata.

STRA'TUM, (pl. STRA'TA), a layer.

STRI'A, (pl. STRI'AE), parallel or radiating lines or markings.

STRI'ATE, marked with striae.

STRI'GOSE, rough with stiff hairs.

STROBIL'IFORM, resembling a pinecone.

STRO'MA, (pl. STRO'MATA), (a) a mass in which another object is embedded; (b) a compact mass of mycelium in the form of a cushion, crust, club or branched expansion upon or in which perithecia or other organs of fructification are borne.

STUFFED, said of a stipe having a lumen filled with a cottony web or spongy substance.

SUB-, prefixed signifies 'somewhat,' 'almost' or 'under.'

SU'BERIZED, transformed into suberin or cork.

SU'BEROSE, corky.

SUB-EROSE', slightly erose.

SUB-GLE'BA, basal portion of the gleba.

SUBIC'ULUM, a more or less thin and dense felt of hyphae covering the matrix; upon its surface is spread the hymenium or from it arise stalks supporting sporophores.

SUBSTRA'TUM, sometimes used in the sense of matrix.

SUBTERRA'NEAN, under ground.

SU'BULATE, SU'BULIFORM, awl-shaped.

SUC'CULENT, fleshy, juicy.

SUL'CATE, grooved.

SUL'CUS, (pl. SUL'CI), groove or furrow.

SULPHU'REOUS, SULFU'REOUS, sulphur-colored.

SUPER-, SUPRA-, prefix meaning 'above' in position or degree.

SUPERFIC'IAL, situated on or close to the surface.

SUPE'RIOR, the upper surface or position; applied to a ring formed from a partial veil which in the young plant has its stipe attachment above the level of its marginal attachment.

SYM'BION, SYM'BIONT, an organism which lives in a state of symbiosis.

SYMBIO'SIS, the coexistence in more or less mutual interdependence of two different organisms; mutualism; mutual parasitism; commensalism; consortism; with some authors commensalism implies an association less necessary or mutually helpful than symbiosis.

SYMBIOT'IC, living in that kind of consociation called symbiosis.

SYN'ONYM, a discarded name for a species or genus; either of two or more names for the same species or genus.

SYNON'YMOUS, expressing the same idea; equivalent in meaning; having the character of a synonym.

TAPE'SIUM, a carpet or layer of mycelium on which the receptacle is situated.

TENA'CEOUS, tough.

TERATOL'OGY, the study of abnormal structures; morphology as applied to monstrous growths; not applied to malformations due to disease.

TE'RETE, cylindrical or nearly so, having a circular transverse section.

TERRES'TRIAL, growing on the ground.

TES'SELATED, arranged in small squares; checkered or reticulated in a regular manner.

TESTA'CEOUS, brick-red.

TETRA-, prefix signifying 'four.'

THAL'LOGEN, same as thallophyte.

THAL'LOPHYTE, one of the so-called "lower cryptogams," plants in which the vegetative body usually consists of a thallus, which see.

THAL'LUS, a vegetative body which is not differentiated into a true root, stem and leaf, has no true vessels or woody fibre; in fungi it is the whole body of the plant not serving directly as an organ of reproduction, i.e.: mycelium, if any, and sporophore but not including the hymenial layer.

THE'CA, same as ascus.

THALA'MIUM, synonym for hymenium.

TIS'SUE, an aggregate of similar cells and cell products in a definite fabric.

TOAD'STOOL. "All the fleshy, umbrella-shaped fungi are toadstools, and to a small number of the best known edible forms the name mushroom is applied popularly and in commerce; but not a small number of the other toadstools are edible." (W. G. Farlow.)

TOMEN'TOSE, TOMEN'TOUS, densely pubescent with matted wool or tomentum.

TOMEN'TUM, a species of pubescence consisting of longish, soft, entangled hairs pressed close to the surface.

TORN, said of pores which are superficially rough and jagged as if torn.

TO'ROSE, TOR'ULOSE, swollen at intervals.

TOR'SION, the state of being twisted spirally.

TOR'SIVE, twisted spirally.

TOR'TUOUS, bending or turning in various directions.

TOX'IC, poisonous.

TRA'MA, (a) the substance, extending from and homogeneous with the hymenophore, interposed between the two layers of the lamella in agarics, and between the double membranes of which the dissepiments of the pores are composed in polypores; (b) the hyphal plates forming the walls of the chambers of the gleba, in gasteromycetes.

TRANSLU'CENT, transmitting rays of light without being transparent.

TRANS'VERSE, from side to side.

TREM'ELLOID, TREM'ELLOSE, of a gelatinous consistency; jelly-like; resembling Tremella.

TRI-, prefix meaning 'three.'

TRI'FID, three parted.

TRIQUET'ROUS, three sided, triangular; applied to the vertical radial section of some dimidiate pilei.

TRUN'CATE, ending abruptly as if cut off.

TU'BAEFORM, trumpet-shaped.

TUBE, TU'BULE, in polypores, tube lined with hymenium; same as pore.

TU'BER, (a) fleshy body, usually of a rounded or oblong form, produced on underground stems, as the potato or artichoke; (b) a genus of underground fungi.

TU'BERCLE, any wart-like or knob-like excrescence; a small swelling.

TUBER'CULAR, TUBER'CULATE, TUBER'CULOSE, having or covered with tubercles; formed like or forming a tubercle.

TUBER'CULIFORM, shaped like a tubercle.

TU'BEROUS, rounded and swollen, resembling a tuber.

TU'BULUS, (pl. TU'BULI), same as tube; pore.

TU'MID, swollen, inflated.

TUR'BINATE, top-shaped; shape of an inverted cone.

TUR'GID, (a) thickened as if swollen; (b) distended with liquid.

TUR'GOR, (a) the state of being turgid; (b) a state by virtue of which the framework of the protoplasm of a plant retains its contents with great tenacity.

TYPE, (a) a perfect specimen or individual exemplifying the essential characters of the species to which it belongs; (b) the original specimen from which a species was described.

TYP'ICAL, having the characteristics of the type.

ULIG'INOSE, ULIG'INOUS, growing in marshes or swamps.

UL'TIMATE, furthest, last.

UM'BER, UM'BRINOUS, umber-colored.

UMBIL'ICATE, having an umbilicus or central navel-like depression.

UMBILI'CUS, a navel-like depression.

UM'BO, a boss or knob in the centre of the pileus.

UM'BONATE, bearing an umbo.

UN'CINATE, tipped with a hook.

UN'DULATE, UN'DATE, having the surface near the margin alternately concave and convex; waved.

UNE'QUAL, applied to lamellae when of unequal lengths; to a stipe not of uniform thickness.

UNE'VEN, said of surfaces that are irregular, striate, sulcate, etc.

UN'GULATE, UN'GULOUS, hoof-shaped.

UNI-, prefix meaning 'one.'

UNICOL'OROUS, of a uniform color; of the same color.

UNISE'RIATE, arranged in one row.

UNIVER'SAL VEIL, see veil.

UNSEP'TATE, having no partitions.

UR'CEOLATE, shaped like a pitcher with a contracted mouth.

U'TERUS, same as peridium in Gastromycetes.

U'TRICLE, any thin bottle-like or bladder-like body.

VAC'UOLATE, VAC'UOLATED, provided with vacuoles.

VAC'UOLE, a cavity of greater or less size within the protoplasmic mass of active vegetable cells filled with water or cell-sap as it is called.

VAG'INATE, furnished with or contained in a sheath; sheathed.

VAGUE, indefinite.

VA'RIABLE, said of a species which embraces many individuals which depart more or less from the type of the group.

VA'RIEGATED, marked with different colors; mottled; same as papilionaceous.

VARI'ETY, a subdivision of a species with minor characteristics uniformly varying from the type.

VAS'ULAR, consisting of, relating to or furnished with vessels or ducts.

VAS'CULIFORM, having the form of a little vessel, like a common flower-pot.

VAS'CULUM, a botanist's case or box for carrying collected specimens.

VAUL'TED, arched like the roof of the mouth.

VEIL, VE'LUM, (a) partial or marginal veil, a special envelope extending from the margin of pileus to the stipe enclosing the lamellae; (b) universal veil or volva, a special envelope enclosing the entire plant in the young state either concrete with the cuticle of the pileus as in *Lepiota* or discrete as in *Amanita*, ultimately ruptured by the expanding pileus. (c) a membranaceous, fibrous or granulose coating stretched over the mouth of an apothecium or cup soon breaking up into fragments.

VEINS, swollen wrinkles on the sides of and at the base between the lamellae, often connected to form cross partitions.

VEL'IFORM, VELAMEN'TOUS, resembling or serving as a veil.

VE'LUM, veil.

VELU'TINE, VELU'TINOUS, velvety.

VE'NATE, VEINED, VE'NOSE, VE'NOUS, having veins.

VEN'TRAL, applied to the under side of pileus; opposite to 'dorsal.'

VEN'TRICOSE, swelling out in the middle; bellying.

VERMIC'ULAR, VERMIC'ULATE, worm-shaped.

VER'NAL, of or pertaining to the Spring.

VER'NICOSE, appearing as if varnished.

VERRU'CA, (pl. VERRU'CAE), wart.

VER'RUCOSE, VERRU'CIFORM, covered with warts.

VERRU'CULOSE, minutely verrucose.

VER'TEX, the upper extremity.

VERTICIL'LATE, whorled.

VES'CICLE, a minute bladder-like cell or cavity.

VESIC'ULAR, VESI'ULATE, VESIC'ULOSE, VESIC'ULOUS, composed of or like vesicles.

VIL'LOSE, VIL'LOUS, covered with long soft weak hairs.

VINOUS, of the color of red wine.

VIOLA'CEOUS, of a violet color.

VIRE'SCENT, green or becoming green.

VIR'GATE, (a) streaked; (b) having wand-like branches.

VIRIDES'CENT, slightly green; greenish.

VIS'CID, moist and sticky.

VIS'COUS, gluey.

VITEL'LINE, egg-yellow color; luteous.

VOL'VA, (a) wrapper; same as universal veil (see veil); the name is often applied to that portion of a discrete volva which is left after rupturing either attached in fragments to, or forming a distinct membranous sheath about the base of the stipe. (b) the peridium in phalloids analogous to the volva in *amanita*.

VOL'VIFORM, having the form of a volva.

WART, any wart-like excrescence; name applied to the wart-like remains of the volva on the surface of the pileus of some *amanitas*.

WAVED, WA'VY, see undulate.

WHORLED, having parts arranged in a circle around an axis; verticillate.

ZO'NATE, ZONED, marked with concentric bands of color.

ZONES, circular bands of color.

BOSTON MYCOLOGICAL CLUB.

The Boston Mycological Club was organized Aug. 24th, 1895, with a view to bring together all those interested economically or scientifically in edible fungi, and has now over four hundred members. Its principal objects are: to study edible mushrooms and toadstools and those noxious and poisonous kinds which may be mistaken for them; to collect and spread all valuable information concerning them; to arouse interest in mushrooms as food; and by exhibitions, lectures, and publications, to make easy and certain the recognition of the few fungi that are poisonous and of the many that are edible.

The Club hopes further to gather information that may be of scientific value in regard to the habitat, season, and distribution of the fungus flora of New England. It is forming an herbarium, for which contributions are solicited.

During the season the Club holds weekly exhibitions and talks, at present on Saturdays from 12 to 3 at Horticultural Hall, 101 Tremont St.; and conducts excursions for study and collection in the field.

During the winter the Club meets monthly for discussions and lectures.

The payment of one dollar annually constitutes membership. Members have the privilege of sending in fungi for identification, of receiving the usual brief reports and bulletins, and are advised as to the best obtainable literature and methods of study. All who are interested in furthering the objects of the Club, and all who are in search of help in the study are invited to join.

Applications should be sent to the Secretary, who will present them to the Executive Committee for approval.

At the annual meeting held April 29th, the following officers were elected for the year ending May 1st, 1900:

President, G. B. Fessenden, 620 Atlantic Ave., Boston.

Vice-President, W. C. Bates, 131 Devonshire St., Boston.

Recording Secretary and Treasurer, Miss Jennie F. Conant, Melrose, Mass.

Executive Committee.—The above named officers and Dr. E. A. Daniels, Mrs. F. A. Pierce, Miss E. W. Rumrill, Hollis Webster.

Corresponding Secretary, HOLLIS WEBSTER, BOX 21, CAMBRIDGE MASS.

PUBLICATIONS OF THE BOSTON MYCOLOGICAL CLUB.

Back numbers of the Bulletins (Nos. 3-8) can be supplied in limited numbers for 75c. a set; current numbers are furnished (free) to members only.

Four-page forms for full notes, descriptive of toadstools, with indication of the most important points to be recorded, are sold for 75c. a hundred.

Address the Treasurer, MISS J. F. CONANT, MELROSE, MASS.

Forms like the following are offered for recording notes in the field.

Blocks of one hundred copies at fifteen cents per block or one dollar and a half per dozen.

Address the Treasurer, MISS J. F. CONANT, MELROSE, MASS.

TOADSTOOLS ——— FIELD NOTES.*

Date		No.
Collected at	after during dry wet weather by	
HABITAT	on ground high low wet rich poor loamy clayey sandy gravelly; on fallen leaves twigs branches logs dead living wood; in open sparsely wooded pasture field lawn roadside swamp dense open evergreen deciduous mixed woods; under trees.	
PLANT	solitary gregarious caespitose not rooting, taste odor	
CAP	dry moist hygrophanous viscid color young old	
MARGIN	straight involute when young not striate when moist dry becoming even.	
STIPE	dry moist hygrophanous viscid glutinous color young old at first -pruinose -pulverulent -farinaceous -furfuraceous above below then naked.	
GILLS	color young old concolorous staining when bruised.	
MILK	color not changing to taste mild acrid.	
VEIL	none evanescent appendiculate arachnoid, thin thick not viscid color	
RING	none trace evanescent fragile, firm persistent, not viscid glutinous, not movable superior inferior medial.	
VOLVA	none evanescent fragile not forming warts, tough membranous persistent, free attached.	
SPORES	color	
ADDITIONAL NOTES.		

*Check with an oblique line each term to be used.

Boston Mycological Club.

Bulletin No. II. (Issued December 16, 1899.)

HOLLIS WEBSTER, Corr. Sec., P. O. Box 21, Cambridge, Mass.

The favorable conditions for the fruiting of fungi, and hence for the collection of them, which existed in the seasons of 1897 and 1898, were not repeated in 1899. In consequence, the exhibitions of the Club at Horticultural Hall during last summer and autumn, though maintained weekly as usual, were not so large and full as before, and the additions to the Club herbarium were few. It is not surprising, either, to find that interest flagged somewhat, because even active search was often productive of small rewards or fruitless altogether. At times, however, and in favored places, mushrooms were abundant enough to keep eaters of them active, and students and collectors on the whole found enough to study. Such stingy seasons are to be expected occasionally, and ought not to quench the ardor of the real amateur.

Indeed, signs multiply that indicate a continued spread of popular interest in mycology. New clubs have been formed, more articles on the subject and some books are being published, and lectures are in demand. Notably, we have seen the issue of Professor Underwood's "Moulds, Mildews and Mushrooms," which ought admirably to orient a student coming at the study from the popular side, and in Boston the Lowell Institute lately offered the public six illustrated lectures on Edible and Poisonous Mushrooms by Prof. W. G. Farlow, which were attended by many who are not members, though they ought to be, of the Boston Mycological Club. So many additions have been made to the literature of mushrooms that space will be given to them in a future bulletin.

ACTIVITIES OF THE CLUB.

Of matters that more intimately concern the Club first mention should be made of the winter meetings in progress, on the third Monday of every month, at the rooms of the Boston Society of Natural History. Although there is usually no definite announcement of topics for presentation and discussion, it should be understood that at every meeting there is a talk of some kind, illustrated, as a rule, from the Club's increasing collection of lantern slides. Only those who attend regularly—and most of the faces at the meetings are familiar—can have any understanding of the resources of the Club in this regard or of the wisdom of adding constantly to this means of illustration, even at considerable expense. Members are urged to bring friends to these meetings, and to let them know that membership is easy to obtain. The attendance at the evening meetings so far has been hardly greater than at the Saturday talks, which always have attracted numerous strangers, many of whom have eventually joined us and added their assistance to the work that the Club is trying to do.

And what is that work? Many members perhaps need to be reminded that the dollar that they pay yearly, and the subscription which those that can have contributed in addition, are really doing something more than bringing them an occasional notice or bulletin, and giving them the somewhat unsatisfactory (because unsatisfied) privilege of asking

questions now and then. They should know that without the fee and subscriptions the weekly exhibitions could not be held; that consequently there would be no material to illustrate the talks; that thus the prime efforts of the Club to spread accurate knowledge of mushrooms, especially of poisonous kinds, must cease, and this at a time when eagerness to gather and devour has become so general that the Club ought to look upon itself as a life-saving, or better, a death-preventing institution. For Providence does not watch over all mycophagists as it seems to over the fungivorous Italians. To make our weekly shows more instructive and complete, genus cards are now displayed, and the fungi are arranged systematically under these, the specific name being added where it is certain. This improvement, as in fact almost the entire success of the weekly talk system, is due to the planning of Miss Noyes.

BULLETINS.

In regard to the bulletins, the issuance of which has been interrupted partly by the occupation and partly by the idleness of the usual editor, it may be said that there is ground for a strong expectation that they will appear in future once in two months. Such is the intention of the publication committee. The Club can be proud of numbers nine and ten, the work, respectively, of Professor Burt and Dr. Daniels. The editor would be pleased to receive questions which might be answered in the bulletins, for what proves troublesome and interesting to one is likely to be so to almost all. The policy of giving brief synopses of groups of species likely to be met with will be continued.

THE HERBARIUM.

Undoubtedly the most valuable permanent work being accomplished by the Club is that which centers in the herbarium. Though it is unfortunately true that this work does not appeal directly to most of the Club members, it should yet be looked upon as of the utmost importance. United with careful study and with note-taking in the field and from plants still fresh, the preservation in the best possible condition of representative material has been and always must be the basis of all accurate knowledge in regard to any plants. The Club has already the nucleus of a good collection of our larger fungi, comprising mainly the species more often met with in New England, particularly about Boston, and frequently exhibited at Horticultural Hall. In fact, the hall tables are a constant and at times the only collecting ground of those in charge of the herbarium.

DRYING AND MOUNTING.

Possibly the treatment and ultimate destination of this material may well be noted here. In the first place entire and in every way undamaged specimens are, if possible, selected. These are taken to the Club quarters at Cambridge, where they are dried, pressed, and preserved in suitable packages, and finally mounted on sheets. For the first step in the process a drier in the form of a sheet-iron box with open wire shelves is used. This box is over two feet wide, a foot and a half deep, and about four feet tall. It contains twelve movable shelves of coarse, stout wire netting, placed three inches apart. Instead of a fixed top, the box has a movable cover, which is usually removed in order to allow the free passage of air, admitted by holes on all sides at the bottom, up through the shelves. There is also no bottom to the box, which is set over a

double-burner gas stove. Metal plates laid on the burners keep the flame from reaching the plants on the shelves, catch dropping larvae and other debris, and help to diffuse the heat. In this simple drying-box a surface of about forty square feet is available for distributing at one time material to be dried over a single source of heat. Moreover, the specimens can be placed near the heater or at a distance according to their size and character. The temperature can be varied at need, and being always, of course, far below the ignition point, does not threaten any labels or other papers placed with the specimens. In this box plants dry in from four to ten hours, usually, according to their moisture and fleshiness. On removal from the drying-box each collection with its label is wrapped temporarily in paper, and the packages, poisoned, if necessary, are left to await convenience for the final treatment, which can be given them in the winter. In this the first step is to moisten slightly the dried material. For this purpose the collections are placed on moistened "driers" (thick sheets of felted paper) on slat shelves in a box hung round within with damp cloths. In the moist atmosphere of the wet-box the plants in a few hours become so flexible that they can be shaped by the fingers and placed in press without fear of injury. In pressing care is taken not to flatten the specimens out completely so as to destroy, for instance, the natural appearance of the gills. They are flattened only enough to pack economically between herbarium sheets. When completely dry the specimens are mounted in special envelopes, each of which bears its appropriate label. The envelopes are then mounted on sheets, which are assembled in genus-covers, to be placed in the pigeon-holes of the cases, just acquired, where they will be available at any time for reference.

LABELS.

The value of such a collection rests on two points :— first, on the completeness with which the prepared specimen represents the essential characteristics of the living plant; second, on the fulness and accuracy of the information recorded on its label,—for a specimen without a satisfactory label, however useful for study, is valueless as a record. Now, since our present business is largely that of completing the record of the occurrence of our native fungi, it can be readily seen that any contributor to the Club collection who wishes to be really helpful, rests under a definite obligation. Though interesting fungi are never unwelcome, they are of permanent value only when accompanied with the following data: 1, the name of the town and state in which the plant was found; 2, the date of the collection; 3, the name of the collector; 4, a brief note of the nature of the plant's habitat (soil, host, surrounding vegetation, elevation, etc.), of its habit of growth, and of its abundance. In the case of unusual plants, much fuller notes should be taken. A print of the spores should also accompany the specimen when possible.

CLUB HEADQUARTERS.

The Club's collections are at present housed in a rear room of the Cambridge Botanical Supply Co., in a space about twenty feet by eight, for which the Club pays at the rate of forty dollars a year. Here are the drying-box, the wet-box, the cases, temporary boxes, shelves bearing bulky specimens (polypores, etc.) in wooden boxes, other shelves bearing bottles containing specimens in formalin or in alcohol, a bench, a table, and all working appliances, supplies, and stores.

If not commodious or quite convenient, this headquarters answers fairly the present needs of the herbarium and will, perhaps, for some time

longer. Yet it is not attractive for Club members to visit, nor is it altogether safe for the Club property, which is exposed to dust, to the ravages of rats and mice, and to danger from fire.

In regard to this matter attention is called to the accompanying circular.

Among the tough, coriaceous fungi so numerous on fallen branches, two kinds, *Schizophyllum* and *Trogia*, are of interest because of the peculiar appearance of the hymenium. Of the two, the former is much more common and conspicuous, and after a little attention is usually recognizable on sight; the latter is less often found, partly because it is apt to be overlooked on account of its small size and resemblance at first sight to the very common species of *Stereum*. These two genera are among those to be recommended for study by those who are taking up the forms of tough tree fungi for the first time.

In collecting fungi that grow on trees it is interesting and important to note whether the parasite is limited to one host plant, or is at home on several. A list, with specimens, should be kept of the hosts by those who like to make a complete record.

SCHIZOPHYLLUM Fr.

Dry, coriaceous. Gills fan-wise branched, united above by a tomentose pellicle, *bifid*, split longitudinally at the edge. Spores somewhat round, white. On wood.

S. commune Fr. Very dry, with a stem-like base, pendulous, or horizontal, entire or lobed, covered with whitish gray down. Gills fuscous gray, then purplish, more or less villous, revolute at the edge. Spores very small. Very common.

The branched structure of the gills is evident on removal of the pellicle.

TROGIA Fr.

Gills like folds, channeled or crisped; stem wanting. Soft, flaccid, but arid and persistent, texture fibrillose. Reviving when wet. Spores white.

T. crispa Fr.—Sessile or nearly so, light yellow-rufescent behind, whitish at the margin, minutely cup-shaped at first, then reflexed horizontal, often very irregular and lobed, delicately villous. Gills in the form of veins, dichotomous, narrow, crisped, swollen when moist and obtuse, but not channeled, whitish or bluish gray.

On branches, twigs, etc., often on the under side of those lying on the ground, or gregarious on logs; frequently imbricated. Rather common. To the variety, which shows bluish or greenish tints on the pileus or hymenium, Peck has given the varietal name of *variegata*.

In the dried condition the pileus curls under and often conceals the hymenium, so that the plant is likely to be passed by as a species of *Stereum*. With moisture the characters appear unmistakably.

T. Alni Peck.—Thin, coriaceous, resupinate-reflexed, generally imbricated, silky-tomentulose, brownish tawny, the margin sterile; folds of the hymenium narrow, irregular, interrupted, wavy or crisped, angular, white. Pileus 8" to 12" broad. Spores minute, narrow, cylindrical, slightly curved, colorless, 5 to 6 + μ long. Somewhat resembles *T. crispa*. The folds disappear to some extent on drying, but reappear with moisture. Growing on trunks of alders.

Boston Mycological Club.

Bulletin No. II. (Issued December 16, 1899.)

HOLLIS WEBSTER, Corr. Sec., P. O. Box 21, Cambridge, Mass.

The favorable conditions for the fruiting of fungi, and hence for the collection of them, which existed in the seasons of 1897 and 1898, were not repeated in 1899. In consequence, the exhibitions of the Club at Horticultural Hall during last summer and autumn, though maintained weekly as usual, were not so large and full as before. and the additions to the Club herbarium were few. It is not surprising, either, to find that interest flagged somewhat, because even active search was often productive of small rewards or fruitless altogether. At times, however, and in favored places, mushrooms were abundant enough to keep eaters of them active, and students and collectors on the whole found enough to study. Such stingy seasons are to be expected occasionally, and ought not to quench the ardor of the real amateur.

Indeed, signs multiply that indicate a continued spread of popular interest in mycology. New clubs have been formed, more articles on the subject and some books are being published, and lectures are in demand. Notably, we have seen the issue of Professor Underwood's "Moulds, Mildews and Mushrooms," which ought admirably to orient a student coming at the study from the popular side, and in Boston the Lowell Institute lately offered the public six illustrated lectures on Edible and Poisonous Mushrooms by Prof. W. G. Farlow, which were attended by many who are not members, though they ought to be, of the Boston Mycological Club. So many additions have been made to the literature of mushrooms that space will be given to them in a future bulletin.

ACTIVITIES OF THE CLUB.

Of matters that more intimately concern the Club first mention should be made of the winter meetings in progress, on the third Monday of every month, at the rooms of the Boston Society of Natural History. Although there is usually no definite announcement of topics for presentation and discussion, it should be understood that at every meeting there is a talk of some kind, illustrated, as a rule, from the Club's increasing collection of lantern slides. Only those who attend regularly—and most of the faces at the meetings are familiar—can have any understanding of the resources of the Club in this regard or of the wisdom of adding constantly to this means of illustration, even at considerable expense. Members are urged to bring friends to these meetings, and to let them know that membership is easy to obtain. The attendance at the evening meetings so far has been hardly greater than at the Saturday talks, which always have attracted numerous strangers, many of whom have eventually joined us and added their assistance to the work that the Club is trying to do.

And what is that work? Many members perhaps need to be reminded that the dollar that they pay yearly, and the subscription which those that can have contributed in addition, are really doing something more than bringing them an occasional notice or bulletin, and giving them the somewhat unsatisfactory (because unsatisfied) privilege of asking

questions now and then. They should know that without the fee and subscriptions the weekly exhibitions could not be held; that consequently there would be no material to illustrate the talks; that thus the prime efforts of the Club to spread accurate knowledge of mushrooms, especially of poisonous kinds, must cease, and this at a time when eagerness to gather and devour has become so general that the Club ought to look upon itself as a life-saving, or better, a death-preventing institution. For Providence does not watch over all mycophagists as it seems to over the fungivorous Italians. To make our weekly shows more instructive and complete, genus cards are now displayed, and the fungi are arranged systematically under these, the specific name being added where it is certain. This improvement, as in fact almost the entire success of the weekly talk system, is due to the planning of Miss Noyes.

BULLETINS.

In regard to the bulletins, the issuance of which has been interrupted partly by the occupation and partly by the idleness of the usual editor, it may be said that there is ground for a strong expectation that they will appear in future once in two months. Such is the intention of the publication committee. The Club can be proud of numbers nine and ten, the work, respectively, of Professor Burt and Dr. Daniels. The editor would be pleased to receive questions which might be answered in the bulletins, for what proves troublesome and interesting to one is likely to be so to almost all. The policy of giving brief synopses of groups of species likely to be met with will be continued.

THE HERBARIUM.

Undoubtedly the most valuable permanent work being accomplished by the Club is that which centers in the herbarium. Though it is unfortunately true that this work does not appeal directly to most of the Club members, it should yet be looked upon as of the utmost importance. United with careful study and with note-taking in the field and from plants still fresh, the preservation in the best possible condition of representative material has been and always must be the basis of all accurate knowledge in regard to any plants. The Club has already the nucleus of a good collection of our larger fungi, comprising mainly the species more often met with in New England, particularly about Boston, and frequently exhibited at Horticultural Hall. In fact, the hall tables are a constant and at times the only collecting ground of those in charge of the herbarium.

DRYING AND MOUNTING.

Possibly the treatment and ultimate destination of this material may well be noted here. In the first place entire and in every way undamaged specimens are, if possible, selected. These are taken to the Club quarters at Cambridge, where they are dried, pressed, and preserved in suitable packages, and finally mounted on sheets. For the first step in the process a drier in the form of a sheet-iron box with open wire shelves is used. This box is over two feet wide, a foot and a half deep, and about four feet tall. It contains twelve movable shelves of coarse, stout wire netting, placed three inches apart. Instead of a fixed top, the box has a movable cover, which is usually removed in order to allow the free passage of air, admitted by holes on all sides at the bottom, up through the shelves. There is also no bottom to the box, which is set over a

To the Members of The Boston Mycological Club.

The members of the Executive Committee, appointed to look after the practical working and needs of the Club, wish to call your attention to the facts exhibited in the accompanying bulletin. In order to make the efforts of the Club more effective, and to increase the number and value of its publications, and to supply it with a convenient and attractive headquarters, which shall ensure the safety of the collection which we have and of the books of reference which we hope for, the Club needs a larger revenue.

To raise the membership fee seems unwise, for we do not wish to exclude anyone who by interest in mushrooms has claims on our respect. Hence it is necessary to enlarge our membership and to add to our funds in other ways, and it seems advisable to ask members to make known the terms of membership to outsiders, and to contribute, if they can, something in addition to the annual fee.

The thanks of the whole club are heartily extended to those members who, in response to a previous appeal, agreed to give and are giving, sums ranging from one to ten dollars yearly for three years. The present appeal is addressed mainly to those who have recently joined, and to others whom the previous request did not reach.

Subscriptions (or gifts) may be forwarded to the Treasurer on the accompanying form.

GEO. B. FESSENDEN,
E. A. DANIELS,
HOLLIS WEBSTER.

double-burner gas stove. Metal plates laid on the burners keep the flame from reaching the plants on the shelves, catch dropping larvae and other debris, and help to diffuse the heat. In this simple drying-box a surface of about forty square feet is available for distributing at one time material to be dried over a single source of heat. Moreover, the specimens can be placed near the heater or at a distance according to their size and character. The temperature can be varied at need, and being always, of course, far below the ignition point, does not threaten any labels or other papers placed with the specimens. In this box plants dry in from four to ten hours, usually, according to their moisture and fleshiness. On removal from the drying-box each collection with its label is wrapped temporarily in paper, and the packages, poisoned, if necessary, are left to await convenience for the final treatment, which can be given them in the winter. In this the first step is to moisten slightly the dried material. For this purpose the collections are placed on moistened "driers" (thick sheets of felted paper) on slat shelves in a box hung round within with damp cloths. In the moist atmosphere of the wet-box the plants in a few hours become so flexible that they can be shaped by the fingers and placed in press without fear of injury. In pressing care is taken not to flatten the specimens out completely so as to destroy, for instance, the natural appearance of the gills. They are flattened only enough to pack economically between herbarium sheets. When completely dry the specimens are mounted in special envelopes, each of which bears its appropriate label. The envelopes are then mounted on sheets, which are assembled in genus-covers, to be placed in the pigeon-holes of the cases, just acquired, where they will be available at any time for reference.

LABELS.

The value of such a collection rests on two points:—first, on the completeness with which the prepared specimen represents the essential characteristics of the living plant; second, on the fulness and accuracy of the information recorded on its label,—for a specimen without a satisfactory label, however useful for study, is valueless as a record. Now, since our present business is largely that of completing the record of the occurrence of our native fungi, it can be readily seen that any contributor to the Club collection who wishes to be really helpful, rests under a definite obligation. Though interesting fungi are never unwelcome, they are of permanent value only when accompanied with the following data: 1, the name of the town and state in which the plant was found; 2, the date of the collection; 3, the name of the collector; 4, a brief note of the nature of the plant's habitat (soil, host, surrounding vegetation, elevation, etc.), of its habit of growth, and of its abundance. In the case of unusual plants, much fuller notes should be taken. A print of the spores should also accompany the specimen when possible.

CLUB HEADQUARTERS.

The Club's collections are at present housed in a rear room of the Cambridge Botanical Supply Co., in a space about twenty feet by eight, for which the Club pays at the rate of forty dollars a year. Here are the drying-box, the wet-box, the cases, temporary boxes, shelves bearing bulky specimens (polypores, etc.) in wooden boxes, other shelves bearing bottles containing specimens in formalin or in alcohol, a bench, a table, and all working appliances, supplies, and stores.

If not commodious or quite convenient, this headquarters answers fairly the present needs of the herbarium and will, perhaps, for some time

longer. Yet it is not attractive for Club members to visit, nor is it altogether safe for the Club property, which is exposed to dust, to the ravages of rats and mice, and to danger from fire.

In regard to this matter attention is called to the accompanying circular.

Among the tough, coriaceous fungi so numerous on fallen branches, two kinds, *Schizophyllum* and *Trogia*, are of interest because of the peculiar appearance of the hymenium. Of the two, the former is much more common and conspicuous, and after a little attention is usually recognizable on sight; the latter is less often found, partly because it is apt to be overlooked on account of its small size and resemblance at first sight to the very common species of *Stereum*. These two genera are among those to be recommended for study by those who are taking up the forms of tough tree fungi for the first time.

In collecting fungi that grow on trees it is interesting and important to note whether the parasite is limited to one host plant, or is at home on several. A list, with specimens, should be kept of the hosts by those who like to make a complete record.

SCHIZOPHYLLUM Fr.

Dry, coriaceous. Gills fan-wise branched, united above by a tomentose pellicle, *bifid*, split longitudinally at the edge. Spores somewhat round, white. On wood.

S. commune Fr. Very dry, with a stem-like base, pendulous, or horizontal, entire or lobed, covered with whitish gray down. Gills fuscous gray, then purplish, more or less villous, revolute at the edge. Spores very small. Very common.

The branched structure of the gills is evident on removal of the pellicle.

TROGIA Fr.

Gills like folds, channeled or crisped; stem wanting. Soft, flaccid, but arid and persistent, texture fibrillose. Reviving when wet. Spores white.

T. crispa Fr.—Sessile or nearly so, light yellow-rufescent behind, whitish at the margin, minutely cup-shaped at first, then reflexed horizontal, often very irregular and lobed, delicately villous. Gills in the form of veins, dichotomous, narrow, crisped, swollen when moist and obtuse, but not channeled, whitish or bluish gray.

On branches, twigs, etc., often on the under side of those lying on the ground, or gregarious on logs; frequently imbricated. Rather common. To the variety, which shows bluish or greenish tints on the pileus or hymenium, Peck has given the varietal name of *variegata*.

In the dried condition the pileus curls under and often conceals the hymenium, so that the plant is likely to be passed by as a species of *Stereum*. With moisture the characters appear unmistakably.

T. Alni Peck.—Thin, coriaceous, resupinate-reflexed, generally imbricated, silky-tomentulose, brownish tawny, the margin sterile; folds of the hymenium narrow, irregular, interrupted, wavy or crisped, angular, white. Pileus 8'' to 12'' broad. Spores minute, narrow, cylindrical, slightly curved, colorless, 5 to 6 + μ long. Somewhat resembles *T. crispa*. The folds disappear to some extent on drying, but reappear with moisture. Growing on trunks of alders.

Boston Mycological Club.

Bulletin No. 12. (Issued February 13, 1900.)

HOLLIS WEBSTER, Corr. Sec., P. O. Box 21, Cambridge, Mass.

The frequent receipt of inquiries as to the literature of mushrooms justifies the publication of the following list of helpful books, pamphlets, and periodicals. A similar list appeared in Bulletin No. 2, copies of which are now exhausted. Moreover, several new titles of recent works are here added.

POPULAR WORKS.*

BRITISH EDIBLE FUNGI, How to Distinguish and How to Cook Them, by M. C. Cooke, is a readable book of nearly 250 pages, containing colored plates of 44 species, with notes on many others, chapters on poisonous fungi and on fungus hunting, and a list of about 200 edible kinds. With very few exceptions all the species mentioned are found in the United States. \$2.50.

EDIBLE AND POISONOUS MUSHROOMS, What to Eat and What to Avoid, by the same author, 126 pp., with colored illustrations of 48 species, is very similar to the preceding and equally useful within its limits. \$1.50.

FÜHRER FÜR PILZFREUNDE, by Edmund Michael, about 150 pp., has descriptions and remarkably fine plates of 68 species, edible and poisonous (of which 18 are Boleti), also recipes for cooking and preserving mushrooms, and other matter. It is of great help even to those ignorant of German, for the species are almost all common with us. \$1.75.

Note. Of the plates in this German handbook only 17 repeat those in Cooke's smaller guide, so that anyone who possesses both will have colored illustrations of 99 species. The combination of Cooke's larger book with Michael gives plates of 98 species.

SOME EDIBLE AND POISONOUS FUNGI, by W. G. Farlow, 18 pp., reprinted from the year-book of the U. S. Dep't. of Agriculture for 1897, pp. 453-470, and issued as Bulletin No. 15 of the Division of Vegetable Physiology and Pathology. This bulletin, published for free distribution, should be in the hands of everyone attempting for the first time to make the acquaintance of edible mushrooms. It contains careful descriptions and advice, especially with regard to the dangerous species, and has ten excellent plates (one colored) illustrating twelve species. It takes the place of the same author's NOTES FOR MUSHROOM EATERS, reprinted from GARDEN AND FOREST, Nos. 309-314, (Jan., Feb., 1894), and now out of print. For this and other government publications application should be made to the Dep't. of Agriculture at Washington, D. C. 35 cts.

OBSERVATIONS ON RECENT CASES OF MUSHROOM POISONING IN THE DISTRICT OF COLUMBIA, by F. V. Coville, 24 pp., also a government publication, issued as Circular No. 13 of the Division of Botany, covers a part of the same ground as the preceding, and is valuable for its 27 figures from life, particularly for those of the poisonous Amanitas. Distributed free. 15 cts.

EDIBLE AND POISONOUS FUNGI, a paper by W. C. Sturgis, 16 pp., with seven plates of thirteen species, may be found in the Report of the Secretary of the Connecticut Board of Agriculture for 1895.

* Prices given are those of the Cambridge Botanical Supply Co., Cambridge, Mass., the lessors of the present quarters of the Club Herbarium.

STUDIES AND ILLUSTRATIONS OF MUSHROOMS, by George F. Atkinson, are published as Bulletins of the Cornell University Agricultural Experiment Station. No. I (Bulletin 138), 30 pp., 26 figures, treats fully *Agaricus campestris* (with illustrations of microscopic details), *Lepiota naucina*, and *Amanita phalloides*. No. II (Bulletin 168), 26 pp., 15 figures, treats in detail with beautiful figures the three commonest species of *Coprinus*. These bulletins are free to residents of New York State. If continued with the same fullness and care, this series will take precedence over other publications of this particular nature. 25 cts.

MUSHROOMS AND THEIR USE, by C. H. Peck, 80 pp., 32 cuts, reprinted from the Cultivator and Country Gentleman of Albany, N. Y. (May 31–Sept. 20, 1894), is an introductory text which has proved of great use to the novice. Under the principal genera the commonest species, about 100 in all, are treated simply, with ample detail, from a systematic standpoint. The author's long experience in investigating the edible qualities of our native mushrooms gives his remarks peculiar value. Published by the Cambridge Botanical Supply Company. 50 cts.

REPORTS OF THE STATE BOTANIST OF NEW YORK, by C. H. Peck. In these reports, which have been appearing annually for thirty years, special attention has always been paid to the edibility of the fungi described or noted as occurring in New York State. The earlier reports are now difficult or impossible to obtain, but the most valuable information for popular use has been collected in the more recent reports and published in company with a continuous series of colored illustrations. Those of special interest are:

THE 48TH (for 1894), 134 pp., 43 plates, which contains, rewritten, the substance of the author's articles on Mushrooms and Their Use, with colored illustrations of 69 species. The special edition of this report is said to be practically exhausted, but the text can still be obtained in the Report of the New York State Museum for 1894, published in 1895, Vol. 1, with plates separate as Vol. 3, and is advertised, with other museum reports since 1892, at 75 cents a volume. Quarto edition, \$5.00.

THE 49TH (for 1895), 14 pp., 6 plates, illustrating 14 species and varieties. 75 cts.

THE 51ST (for 1897), 18 pp., 8 plates, illustrating 19 species and varieties. Published at 40 cts. 50 cts.

THE 52ND (for 1898), 16 pp., 5 plates, illustrating 13 species and varieties, has recently appeared as Bulletin Vol. 5, No. 25. Published at 40 cts. 50 cts.

N. B. In the case of these reports the number of pages given is of those that accompany the plates.

OUR EDIBLE TOADSTOOLS AND MUSHROOMS, by W. H. Gibson, 337 pp., 38 plates, and many figures; a readable book, which has proved interesting and serviceable, and has had a large sale. If a person has only the price of this book to spend on the literature of mushrooms, he would be wise to buy instead those of Cooke, Michael, and Peck, already mentioned. \$7.50.

STUDENT'S HANDBOOK OF MUSHROOMS OF AMERICA, by Thomas Taylor, 120 pp., 26 plates, largely colored. Contains much detailed information about particular species, and also in regard to structure and classification. \$3.00.

MOULDS, MILDEWS, AND MUSHROOMS, by L. M. Underwood, 227 pp., 10 plates, is a "guide to the study of the fungi and mycetozoa and their literature." This work gives a general survey of the field, treating of the relations of fungi to other plants; of their reproduction, constituents, and habits; of the characteristics of the principal groups of fungi, with keys to assist in the discrimination of genera, and often brief notes on conspicuous species; of the study of mycology in gen-

RHODORA.

The undersigned, as one of the editors of the Journal of the New England Botanical Club, wishes to express his appreciation of the support given to Rhodora during its first year by members of the Mycological Club. At the same time he wishes to ask for a continuance of this support, and also to bring the Journal to the attention of those to whom it is at present unknown. The aim of the Botanical Club is to stimulate and unite the botanical activities of New England, and in the furtherance of its enterprise it hopes for the interest and assistance of students and amateurs in all departments of botanical inquiry. By giving their support to Rhodora, and by making Rhodora known to as many people as possible, the members of the Mycological Club can do a real service to the cause of botany, can help to make the study of our local flora more thorough, and its records more complete, and can expect increasing attention and space to be given by the Journal to fleshy fungi.

The hope is here expressed that readers of this will try to find subscribers for the Journal. Copies for examination will gladly be sent to any address. The price is **\$1.00 a year.**

During 1899 the following articles on fungi appeared in Rhodora:

- W. G. Farlow: Poisoning by *Agaricus illudens*.
- E. A. Burt: Vermont *Helvelleae* with Descriptive Notes [with plate].
- F. S. Collins: A Case of *Boletus* Poisoning.
- L. C. Whitney: List of Vermont *Myxomycetes* with Notes.
- C. O. Smith: Notes on the Species of *Agaricus* (*Psalliota*) of the Champlain Valley.
- F. J. Wills: On the Edibility of *Clitocybe illudens*.
- H. Webster: A Boston *Lactarius*, *Boletus Russellii*, Two Edible *Hygrophori*; Notes on *Calostoma*; Fungus Notes [on *Tricholoma equestre*]; Fungi in Greenhouses; *Hydnum Caput-Medusae*; Peculiar state of *Polyporus pergamenus*; Note on *Morchella bispora*; *Lepiota rhacodes* [with plate].

Subscriptions or inquiries may be addressed to E. L. Rand, 740 Exchange Building, Boston, or to the undersigned.

HOLLIS WEBSTER, Box 21, Cambridge, Mass.
Feb. 12th, 1900.

eral, and in America in particular, with the most important bibliographical references; of the geographic distribution of American fungi; and of methods of collection and preservation with hints for further study. Its aim is to direct the efforts of the untrained student of the subject, to give him the most important facts, and to point out the places where detailed information may be found. \$1.50.

THE STRUCTURE AND CLASSIFICATION OF MUSHROOMS, by H. Webster, a lecture delivered in 1897, reprinted from the Proceedings of the Massachusetts Horticultural Society. 25 cts.

AMERICAN FUNGI, Eight Hundred Species of Toadstools, illustrated with 32 colored plates and over 500 cuts, is in preparation by Charles McIlvaine and R. K. Macadam. The subscription price is \$10.00.

HOW TO GROW MUSHROOMS, by William Falconer, 19 pp., 14 figures, gives in compact form the necessary directions for experiments in cultivation for the table or the market. This is published as Farmer's Bulletin No. 53, and may be had from the Dep't of Agriculture, on application.

PERIODICALS.

THE ASA GRAY BULLETIN, published every two months, by Thos. A. Williams and Cornelius L. Shear, Takoma Park, D. C., the last volume of which contained 124 pages, makes a point of popular articles on fungi, and of notes and reviews of mycological interest. Per year, 50 cts.

RHODORA, THE JOURNAL OF THE NEW ENGLAND BOTANICAL CLUB, published monthly by a committee appointed by the Club, intends to give space to mushrooms and other fungi of New England. Its first volume, completed in December, contained 243 pages, and 14 articles on fungi. Subscriptions may be sent to E. L. Rand, 740 Exchange Building, Boston. Per year, \$1.00.

TECHNICAL WORKS.

Of these there are a very large number, of which the following are most available:

BRITISH FUNGI (Hymenomycetes), by Rev. John Stevenson; a systematic work in two volumes, and a fairly trustworthy guide in the determination of species. \$8.06.

BRITISH FUNGUS FLORA, by George Masee; a systematic work in four volumes, of which the last treats of the Ascomycetes, is more complete than Stevenson, and with fuller descriptions, although not so accurately done. The first three volumes are all that are necessary for students of the Basidiomycetes. Many find this more useful than Stevenson. Per vol., \$2.00.

CLAVIS AGARICINORUM, by W. G. Smith, 40 pp., 6 plates, contains descriptions of families and genera; appended are figures to show the structure and relationship of the genera, according to Fries, of the Agarics proper; there is a key to genera, and a list of British Agarics known at the time (1870). 75 cts.

A MANUAL OF THE BRITISH DISCOMYCETES, by William Phillips, is a standard systematic treatment of the Pezizas, Morels, Helvellas, and related fungi. It covers the ground of Masee's fourth volume. One or the other is necessary for students of this group. It is well illustrated. \$1.50.

NOUVELLE FLORE DES CHAMPIGNONS, pour la détermination facile de toutes les espèces, avec 4166 figures, par MM. Constantin et Dufour, is a systematic work, consisting of a continuous analytical key, in which the statement of diagnostic characters is packed into lx + 289 pages, and the figures are reduced to the size of the thumb-nail. This has proved

useful, and no doubt would rapidly give a general familiarity with the systematic conspectus; all the specific names are translated. \$1.50.

PECK'S REPORTS, as noted above, contain notes and remarks upon all species of fungi found in New York, and descriptions of all that the author regards as new. Many of the reports, particularly those of the last ten years, contain synopses of genera, with full descriptions of all New York species. Those obtainable vary in price from 40 cts. to \$1.50.

BOLETI OF THE UNITED STATES, by the same author, published as Bulletin Vol. 2, No. 8, of the New York State Museum, contains descriptions of over 100 species, with analytical keys. It is indispensable to the student of our Boleti. 50 cts.

THE MYCOLOGIC FLORA OF THE MIAMI VALLEY, by A. P. Morgan, is a systematic arrangement of the fungi found in a limited region in Ohio. It was published in six parts in the Journal of the Cincinnati Society of Natural History, and is difficult to obtain. \$6.00.

NORTH AMERICAN FUNGI, THE GASTEROMYCETES, by the same author, published in five parts in the same journal, is a revision with full descriptions of the Puff-balls of North America, indispensable to a student of the group. \$1.25.

CALIFORNIAN HYPOGAEUS FUNGI, by H. W. Harkness, an account of 108 species of underground fungi discovered in California, 34 of which are figured in colors; published in the Proceedings of the California Academy of Sciences, Third Series, Botany, Vol. I, No. 8. 75 cts.

THE PHALLOIDEAE OF THE UNITED STATES, II, Systematic account, describes with full detail the 10 Species of Stinkhorns discovered in this country up to 1896. This monograph is indispensable to the student. It appeared originally in the Botanical Gazette, Vol. XXII, No. 5, November, 1896. Published separately. 25 cts.

COLLECTING AND PREPARING FUNGI FOR THE HERBARIUM, by the same author, is a useful guide to the practical handling of fungus material. This also appeared in the Botanical Gazette, Vol. XXV, No. 3, March 1898. Published separately. 25 cts.

FUNGAL FLORA OF THE LEHIGH VALLEY by William Herbst, lists the fungi of a limited area in Pennsylvania, with brief notices of each. \$1.75.

MYCOLOGICAL NOTES by C. G. Lloyd, a series of synoptic descriptions and notes, are distributed by the author to his correspondents and many other students of mushrooms.

THE NORTH AMERICAN SLIME MOULDS, by Thomas H. Macbride, is a full systematic and critical treatment of all the species of Myxomycetes known from North America, of which about 135, many new, are figured on the 19 plates. It contains a bibliography of the group. \$2.25.

A popular introduction to the study of the Slime Moulds has been prepared by the same author for Rhodora, and will shortly appear.

Most of the works here listed are such as might prove useful on the shelves of an amateur, who wishes to gain some knowledge of systematic arrangement. In addition to these there is a large number of extensive works, monographs, articles in journals, etc., which are to be found only in botanical centres. They are absolutely necessary for any thorough critical study of the fungi, and, in connection with herbaria of authentic specimens, are the constant resource and support of specialists on the subject.

The request not infrequently made for a "Gray's Manual" which treats of American fungi can be answered only by referring to what has just been said. Even when such a systematic work is ready for general use, and one will eventually appear, the use of it will require much knowledge, experience, and judgement.

Boston Mycological Club.

Bulletin No. 12. (Issued February 13, 1900.)

HOLLIS WEBSTER, Corr. Sec., P. O. Box 21, Cambridge, Mass.

The frequent receipt of inquiries as to the literature of mushrooms justifies the publication of the following list of helpful books, pamphlets, and periodicals. A similar list appeared in Bulletin No. 2, copies of which are now exhausted. Moreover, several new titles of recent works are here added.

POPULAR WORKS.*

BRITISH EDIBLE FUNGI, How to Distinguish and How to Cook Them, by M. C. Cooke, is a readable book of nearly 250 pages, containing colored plates of 44 species, with notes on many others, chapters on poisonous fungi and on fungus hunting, and a list of about 200 edible kinds. With very few exceptions all the species mentioned are found in the United States. \$2.50.

EDIBLE AND POISONOUS MUSHROOMS, What to Eat and What to Avoid, by the same author, 126 pp., with colored illustrations of 48 species, is very similar to the preceding and equally useful within its limits. \$1.50.

FÜHRER FÜR PILZFREUNDE, by Edmund Michael, about 150 pp., has descriptions and remarkably fine plates of 68 species, edible and poisonous (of which 18 are Boleti), also recipes for cooking and preserving mushrooms, and other matter. It is of great help even to those ignorant of German, for the species are almost all common with us. \$1.75.

Note. Of the plates in this German handbook only 17 repeat those in Cooke's smaller guide, so that anyone who possesses both will have colored illustrations of 99 species. The combination of Cooke's larger book with Michael gives plates of 98 species.

SOME EDIBLE AND POISONOUS FUNGI, by W. G. Farlow, 18 pp., reprinted from the year-book of the U. S. Dep't. of Agriculture for 1897, pp. 453-470, and issued as Bulletin No. 15 of the Division of Vegetable Physiology and Pathology. This bulletin, published for free distribution, should be in the hands of everyone attempting for the first time to make the acquaintance of edible mushrooms. It contains careful descriptions and advice, especially with regard to the dangerous species, and has ten excellent plates (one colored) illustrating twelve species. It takes the place of the same author's NOTES FOR MUSHROOM EATERS, reprinted from GARDEN AND FOREST, Nos. 309-314, (Jan., Feb., 1894), and now out of print. For this and other government publications application should be made to the Dep't. of Agriculture at Washington, D. C. 35 cts.

OBSERVATIONS ON RECENT CASES OF MUSHROOM POISONING IN THE DISTRICT OF COLUMBIA, by F. V. Coville, 24 pp., also a government publication, issued as Circular No. 13 of the Division of Botany, covers a part of the same ground as the preceding, and is valuable for its 27 figures from life, particularly for those of the poisonous Amanitas. Distributed free. 15 cts.

EDIBLE AND POISONOUS FUNGI, a paper by W. C. Sturgis, 16 pp., with seven plates of thirteen species, may be found in the Report of the Secretary of the Connecticut Board of Agriculture for 1895.

* Prices given are those of the Cambridge Botanical Supply Co., Cambridge, Mass., the lessors of the present quarters of the Club Herbarium.

STUDIES AND ILLUSTRATIONS OF MUSHROOMS, by George F. Atkinson, are published as Bulletins of the Cornell University Agricultural Experiment Station. No. I (Bulletin 138), 30 pp., 26 figures, treats fully *Agaricus campestris* (with illustrations of microscopic details), *Lepiota naucina*, and *Amanita phalloides*. No. II (Bulletin 168), 26 pp., 15 figures, treats in detail with beautiful figures the three commonest species of *Coprinus*. These bulletins are free to residents of New York State. If continued with the same fullness and care, this series will take precedence over other publications of this particular nature. 25 cts.

MUSHROOMS AND THEIR USE, by C. H. Peck, 80 pp., 32 cuts, reprinted from the Cultivator and Country Gentleman of Albany, N. Y. (May 31-Sept. 20, 1894), is an introductory text which has proved of great use to the novice. Under the principal genera the commonest species, about 100 in all, are treated simply, with ample detail, from a systematic standpoint. The author's long experience in investigating the edible qualities of our native mushrooms gives his remarks peculiar value. Published by the Cambridge Botanical Supply Company. 50 cts.

REPORTS OF THE STATE BOTANIST OF NEW YORK, by C. H. Peck. In these reports, which have been appearing annually for thirty years, special attention has always been paid to the edibility of the fungi described or noted as occurring in New York State. The earlier reports are now difficult or impossible to obtain, but the most valuable information for popular use has been collected in the more recent reports and published in company with a continuous series of colored illustrations. Those of special interest are:

THE 48TH (for 1894), 134 pp., 43 plates, which contains, rewritten, the substance of the author's articles on Mushrooms and Their Use, with colored illustrations of 69 species. The special edition of this report is said to be practically exhausted, but the text can still be obtained in the Report of the New York State Museum for 1894, published in 1895, Vol. 1, with plates separate as Vol. 3, and is advertised, with other museum reports since 1892, at 75 cents a volume. Quarto edition, \$5.00.

THE 49TH (for 1895), 14 pp., 6 plates, illustrating 14 species and varieties. 75 cts.

THE 51ST (for 1897), 18 pp., 8 plates, illustrating 19 species and varieties. Published at 40 cts. 50 cts.

THE 52ND (for 1898), 16 pp., 5 plates, illustrating 13 species and varieties, has recently appeared as Bulletin Vol. 5, No. 25. Published at 40 cts. 50 cts.

N. B. In the case of these reports the number of pages given is of those that accompany the plates.

OUR EDIBLE TOADSTOOLS AND MUSHROOMS, by W. H. Gibson, 337 pp., 38 plates, and many figures; a readable book, which has proved interesting and serviceable, and has had a large sale. If a person has only the price of this book to spend on the literature of mushrooms, he would be wise to buy instead those of Cooke, Michael, and Peck, already mentioned. \$7.50.

STUDENT'S HANDBOOK OF MUSHROOMS OF AMERICA, by Thomas Taylor, 120 pp., 26 plates, largely colored. Contains much detailed information about particular species, and also in regard to structure and classification. \$3.00.

MOULDS, MILDEWS, AND MUSHROOMS, by L. M. Underwood, 227 pp., 10 plates, is a "guide to the study of the fungi and mycetozoa and their literature." This work gives a general survey of the field, treating of the relations of fungi to other plants; of their reproduction, constituents, and habits; of the characteristics of the principal groups of fungi, with keys to assist in the discrimination of genera, and often brief notes on conspicuous species; of the study of mycology in gen-

RHODORA.

The undersigned, as one of the editors of the Journal of the New England Botanical Club, wishes to express his appreciation of the support given to Rhodora during its first year by members of the Mycological Club. At the same time he wishes to ask for a continuance of this support, and also to bring the Journal to the attention of those to whom it is at present unknown. The aim of the Botanical Club is to stimulate and unite the botanical activities of New England, and in the furtherance of its enterprise it hopes for the interest and assistance of students and amateurs in all departments of botanical inquiry. By giving their support to Rhodora, and by making Rhodora known to as many people as possible, the members of the Mycological Club can do a real service to the cause of botany, can help to make the study of our local flora more thorough, and its records more complete, and can expect increasing attention and space to be given by the Journal to fleshy fungi.

The hope is here expressed that readers of this will try to find subscribers for the Journal. Copies for examination will gladly be sent to any address. The price is \$1.00 a year.

During 1899 the following articles on fungi appeared in Rhodora:

W. G. Farlow: Poisoning by *Agaricus illudens*.

E. A. Burt: Vermont *Helvelleae* with Descriptive Notes [with plate].

F. S. Collins: A Case of *Boletus* Poisoning.

L. C. Whitney: List of Vermont *Myxomycetes* with Notes.

C. O. Smith: Notes on the Species of *Agaricus* (*Psalliota*) of the Champlain Valley.

F. J. Wills: On the Edibility of *Clitocybe illudens*.

H. Webster: A Boston *Lactarius*, *Boletus Russellii*, Two Edible *Hygrophori*; Notes on *Calostoma*; Fungus Notes [on *Tricholoma equestre*]; Fungi in Greenhouses; *Hydnum Caput-Medusae*; Peculiar state of *Polyporus pergamenus*; Note on *Morchella bispora*; *Lepiota rhacodes* [with plate].

Subscriptions or inquiries may be addressed to E. L. Rand, 740 Exchange Building, Boston, or to the undersigned.

HOLLIS WEBSTER, Box 21, Cambridge, Mass.

Feb. 12th, 1900.

eral, and in America in particular, with the most important bibliographical references; of the geographic distribution of American fungi; and of methods of collection and preservation with hints for further study. Its aim is to direct the efforts of the untrained student of the subject, to give him the most important facts, and to point out the places where detailed information may be found. \$1.50.

THE STRUCTURE AND CLASSIFICATION OF MUSHROOMS, by H. Webster, a lecture delivered in 1897, reprinted from the Proceedings of the Massachusetts Horticultural Society. 25 cts.

AMERICAN FUNGI, Eight Hundred Species of Toadstools, illustrated with 32 colored plates and over 500 cuts, is in preparation by Charles McIlvaine and R. K. Macadam. The subscription price is \$10.00.

HOW TO GROW MUSHROOMS, by William Falconer, 19 pp., 14 figures, gives in compact form the necessary directions for experiments in cultivation for the table or the market. This is published as Farmer's Bulletin No. 53, and may be had from the Dep't of Agriculture, on application.

PERIODICALS.

THE ASA GRAY BULLETIN, published every two months, by Thos. A. Williams and Cornelius L. Shear, Takoma Park, D. C., the last volume of which contained 124 pages, makes a point of popular articles on fungi, and of notes and reviews of mycological interest. Per year, 50 cts.

RHODORA, THE JOURNAL OF THE NEW ENGLAND BOTANICAL CLUB, published monthly by a committee appointed by the Club, intends to give space to mushrooms and other fungi of New England. Its first volume, completed in December, contained 243 pages, and 14 articles on fungi. Subscriptions may be sent to E. L. Rand, 740 Exchange Building, Boston. Per year, \$1.00.

TECHNICAL WORKS.

Of these there are a very large number, of which the following are most available:

BRITISH FUNGI (Hymenomycetes), by Rev. John Stevenson; a systematic work in two volumes, and a fairly trustworthy guide in the determination of species. \$8.06.

BRITISH FUNGUS FLORA, by George Masee; a systematic work in four volumes, of which the last treats of the Ascomycetes, is more complete than Stevenson, and with fuller descriptions, although not so accurately done. The first three volumes are all that are necessary for students of the Basidiomycetes. Many find this more useful than Stevenson. Per vol., \$2.00.

CLAVIS AGARICINORUM, by W. G. Smith, 40 pp., 6 plates, contains descriptions of families and genera; appended are figures to show the structure and relationship of the genera, according to Fries, of the Agarics proper; there is a key to genera, and a list of British Agarics known at the time (1870). 75 cts.

A MANUAL OF THE BRITISH DISCOMYCETES, by William Phillips, is a standard systematic treatment of the Pezizas, Morels, Helvellas, and related fungi. It covers the ground of Masee's fourth volume. One or the other is necessary for students of this group. It is well illustrated. \$1.50.

NOUVELLE FLORE DES CHAMPIGNONS, pour la détermination facile de toutes les espèces, avec 4166 figures, par MM. Constantin et Dufour, is a systematic work, consisting of a continuous analytical key, in which the statement of diagnostic characters is packed into 1x + 289 pages, and the figures are reduced to the size of the thumb-nail. This has proved

useful, and no doubt would rapidly give a general familiarity with the systematic conspectus; all the specific names are translated. \$1.50.

PECK'S REPORTS, as noted above, contain notes and remarks upon all species of fungi found in New York, and descriptions of all that the author regards as new. Many of the reports, particularly those of the last ten years, contain synopses of genera, with full descriptions of all New York species. Those obtainable vary in price from 40 cts. to \$1.50.

BOLETI OF THE UNITED STATES, by the same author, published as Bulletin Vol. 2, No. 8, of the New York State Museum, contains descriptions of over 100 species, with analytical keys. It is indispensable to the student of our Boleti. 50 cts.

THE MYCOLOGIC FLORA OF THE MIAMI VALLEY, by A. P. Morgan, is a systematic arrangement of the fungi found in a limited region in Ohio. It was published in six parts in the Journal of the Cincinnati Society of Natural History, and is difficult to obtain. \$6.00.

NORTH AMERICAN FUNGI, THE GASTEROMYCETES, by the same author, published in five parts in the same journal, is a revision with full descriptions of the Puff-balls of North America, indispensable to a student of the group. \$1.25.

CALIFORNIAN HYPOGAEUS FUNGI, by H. W. Harkness, an account of 108 species of underground fungi discovered in California, 34 of which are figured in colors; published in the Proceedings of the California Academy of Sciences, Third Series, Botany, Vol. I, No. 8. 75 cts.

THE PHALLOIDEAE OF THE UNITED STATES, II, Systematic account, describes with full detail the 10 Species of Stinkhorns discovered in this country up to 1896. This monograph is indispensable to the student. It appeared originally in the Botanical Gazette, Vol. XXII, No. 5, November, 1896. Published separately. 25 cts.

COLLECTING AND PREPARING FUNGI FOR THE HERBARIUM, by the same author, is a useful guide to the practical handling of fungus material. This also appeared in the Botanical Gazette, Vol. XXV, No. 3, March 1898. Published separately. 25 cts.

FUNGAL FLORA OF THE LEHIGH VALLEY by William Herbst, lists the fungi of a limited area in Pennsylvania, with brief notices of each. \$1.75.

MYCOLOGICAL NOTES by C. G. Lloyd, a series of synoptic descriptions and notes, are distributed by the author to his correspondents and many other students of mushrooms.

THE NORTH AMERICAN SLIME MOULDS, by Thomas H. Macbride, is a full systematic and critical treatment of all the species of Myxomycetes known from North America, of which about 135, many new, are figured on the 19 plates. It contains a bibliography of the group. \$2.25.

A popular introduction to the study of the Slime Moulds has been prepared by the same author for Rhodora, and will shortly appear.

Most of the works here listed are such as might prove useful on the shelves of an amateur, who wishes to gain some knowledge of systematic arrangement. In addition to these there is a large number of extensive works, monographs, articles in journals, etc., which are to be found only in botanical centres. They are absolutely necessary for any thorough critical study of the fungi, and, in connection with herbaria of authentic specimens, are the constant resource and support of specialists on the subject.

The request not infrequently made for a "Gray's Manual" which treats of American fungi can be answered only by referring to what has just been said. Even when such a systematic work is ready for general use, and one will eventually appear, the use of it will require much knowledge, experience, and judgement.

Boston Mycological Club.

Bulletins No. 13 and 14. (Issued June 6, 1900.)

HOLLIS WEBSTER, Corr. Sec., P. O. Box 21, Cambridge, Mass.

The species of woody fungi which fall into the genera *Trametes*, *Daedalea*, and *Lenzites* are very naturally associated. In habit of growth, superficial appearance, and texture their resemblance is so evident as to suggest that they should be classed together. Owing, however, to the stress laid by systematists upon the form of the surface over which the layer of spore bearing cells, or hymenium, is spread, *Lenzites*, because of its lamellae, has generally been appended to the agarics, *Trametes* has been placed either with or closely following *Polyporus*, and *Daedalea* has been put near by. Such a separation is rendered inconvenient by the existence of many connecting forms, species of *Lenzites* frequently exhibiting more or less perfectly formed pores, while species of *Trametes*, and particularly of *Daedalea*, show more or less perfectly formed lamellae. Furthermore, the line between *Trametes* and *Polyporus* is by no means distinct.

In *Trametes*, as the name implies, the trama, or framework of the hymenium is well developed, and is plainly continuous with the substance of the pileus. This is generally evident to the eye, even without a hand lens, on examination of the face of a vertical section. Owing to the prominence of the trama, the pores are often small, and the partitions between the tubes are rather thick and obtuse. The tubes, too, are often rather long, and inserted at unequal depths, thus not forming a stratum well marked off from the substance of the pileus, as in *Polyporus*.

Daedalea includes those species, otherwise like *Trametes*, in which the pores are elongated and sinuous; but unless this character is marked, the advantage of drawing a line between the two is not obvious. The lengthening of the pores is generally greatest in lines radiating from the point of attachment of the pileus. Hence it is clear that a sufficient lengthening will eventually give us lamellae, which may be connected here and there by cross partitions. When such forms occur, if the lamellae are straight, we have something that must be referred to *Lenzites*.

Strictly defined, *Lenzites* would include only those forms in which the lamellae begin as radiating ridges, and would exclude forms which, starting with pores (*Trametes*) or with sinuses (*Daedalea*), eventually become lamelloid by the elongation vertically of the radiating partitions, and the disappearance of cross partitions, or anastomosing connections. In practice, however, these forms have been often referred to *Lenzites*.

In *Daedalea* and *Lenzites* the partitions, or lamellae, are often very thin, so that the trama is only evident at the point of attachment with the pileus. These forms approach, in this regard, the condition in those species of *Polyporus* proper in which the partitions are generally thin. Another complication comes in with differences of habit and habitat. The same species of *Daedalea* or *Trametes* may be, as in *Polyporus*, at one time resupinate, at another effused with reflexed margin, or again dimidiate and sessile or stipitate. The effused portion of a *Lenzites*, or an imperfectly developed, tubercular form, is usually porous.

These different tendencies in form of the hymenium appear sometimes in the same species, as for instance in *Daedalea ambigua* and *D. confragosa*. If the differences happen to be accompanied, as they often are, by slight variation in color, marking, texture, and proportions, the temptation to multiply species is great. Thus some authors separate, others unite, such series of forms, while others, knowing only a single

phase, perhaps only a single specimen, of a variable species, publish a description and a name based on such exceedingly fragmentary material.

It should then be evident that for the study of this group of fungi the first requisite is ample material, which should be gathered at different seasons, from different hosts, and in different habitats, until enough is accumulated to show the range of form that may be taken by each species. Although this will take time, it will add zest to collecting trips, and keep alive an interest in the commonest species.

The species included in this bulletin are in the main those ascribed to the United States in Saccardo's Sylloge. A few have been added, the descriptions of which are useful for comparison. The list is in no sense a list of American species; it is simply a compilation of those descriptions likely to be most needed for reference by a student new to the group. Where possible, original sources have been visited, but little attempt has been made to digest the material or to reconcile the synonymy.

For convenience the species under each genus have been grouped according to color and surface characters. Since these are variable in a given species, they must not be exclusively relied upon. Certain species, as will be seen, hardly lend themselves to this arrangement.

TRAMETES Fr.

Pores roundish, obtuse, entire, often unequal in depth and not forming a distinct stratum, at the base merged in the substance of the pileus, whence the trama is continuous with the substance of the pileus and similar to it. Woody or corky, growing on trees, becoming hard, but not stratose, often fragrant.

A genus distinguished from *Daedalea* by not having sinuous pores; and from *Polyporus* by not having a pore-stratum sharply distinct, by color and structure, from the substance of the pileus.

Resupinate or more or less effused (A and B).

A. Pileus or substance brown or tawny.

T. Abietis Karst. Triquetrous, dimidiate, base commonly effused, then entirely resupinate, forming roundish patches, often growing together or imbricated, tomentose and tawny when young, afterwards dark brown or fuscous, scrobiculate or scrupose, finally becoming black, with a few concentric furrows; pores rather large, oblong or roundish, unequal, torn, tawny, hoary pubescent; spores spheroid, hyaline, 4 μ diam. On *Abies*. *Polystictus piceinus* Peck is said to be this species.

T. gausapata Berk. & Rav. Base effused, pilei reflexed, generally resupinate and confluent, velvety, zoned, dark reddish brown, coriaceous, (1 in. broad), substance fuscous; pore-surface pallid umber; pores at length angular, subacute ($\frac{1}{2}$ mm. diam.).

T. rigida Berk and Mont. Effused, slightly reflexed, often confluent, coriaceous-rigid, more or less concentrically sulcate, rugose, velvety, pale tawny wood-color, substance concolorous; pores small, roundish or slightly flexuous, pallid wood-color, edge obtuse. South.

B. White, whitish, or pallid.

T. radiciperda Hartig, which fruits on the roots of certain conifers, at or below the surface of the ground, and on the cut face of standing stumps (Hartig), is generally considered to be an irregular effused form of *Polyporus annosus* Fr. It appears in white, spreading, resupinate patches, with swollen sterile borders, forming a raised enclosure around the pore surface. Upper surface, when free, chocolate color, then darker,

zoned, edge white, generally very irregular, attached to sticks, dirt, etc; when young slightly silky, later smooth, shining. With age the pores are filled up and become dark and sterile in patches, covered here and there by a new white hymenium; smell like that of *Boletus edulis*; texture of soft leather; pores at first .2 to .3 mm. broad.

T. mollis (Sommerf.) Fr. Resupinate, submembranaceous, pallid wood-color, then fuscous, margin at length revolute, dark and pubescent underneath; pores ample, unequal and torn. On maple, birch, etc.

T. serpens Fr. Dry, closely adnate-resupinate, erumpent, tuberculiform, orbicular, then confluent, white, border determinate, pubescent; pores roundish or angular, unequal, obtuse. At length paler.

T. sepium Berk. Effused at base, reflexed, often laterally confluent, finely tomentose, repeatedly zoned, pale wood-colored, coriaceous; substance white; hymenium pallid; pores slightly sinuated, about $\frac{1}{30}$ in. across. Widely distributed.

T. serialis Fr. Towy-corky, effuso-reflexed, seriatly extended, narrow, confluent, wrinkled and pitted with soft appressed hairs, white at first, then brown or brownish red; margin obtuse; pores obtuse, minute, unequal, white. Commonly resupinate. On spruce.

T. versatilis Berk. Long effused, margin broadly reflexed, whitish, extremely thin, flexible, clothed with coarse down, silky towards the margin, which is acute and pale bay; pores nearly of the color of the margin, deep, regular at first, then variously sinuated; dissepiments toothed, elongated, longest towards the base. Louisiana.

Distinctly pileate, but in some cases effused at base (C, D, and E).

C. Pileus covered with hairs.

T. hydroides (Swartz) Fr. Flat, zoneless, dark bay or brown, covered with rigid branching dark hairs; within ferruginous; pores minute, rounded, equal, obtuse, ferruginous. Very common in warm regions. Often becoming nearly bald with age; variable in color, size, and thickness.

T. Feathermanni Rav. is said to be a form of the last, very dark, coriaceous, with thick hairs.

T. Trogii Berk. Fuscous, subolivaceous; pileus convex, at first smoothish, unequal, then covered with rigid hairs 3 lines long, and somewhat zonate, margin acute, substance white; pores somewhat angular, toothed. Dead poplar. Eur.

T. Peckii Kalchbr. Sub-decurrent, brownish ferruginous, becoming pale, hairy, zoneless, margin acute; substance wood-color, pores rather large, rounded angular, nearly concolorous, or becoming brown. Hairs longer, pores larger and darker than in the American form of *T. Trogii*. Distinguished by the seal brown hairs. West. Said to be *T. funalis* (Fr.) Ell. & Ev.

T. Lindheimeri B. & C. A southern species, pale tawny, plane, covered with soft matted strigose hairs, with thin margin and pores at length dingy umber, of medium size, slightly angular, dissepiments thin, often elongated into teeth, is now referred to *Polystictus* (Cooke).

D. Pileus or substance brown, brownish, or tawny.

T. trabea (Pers) Bres. = *T. protracta* Fr. = *Daedalea pallido-fulva* Berk. = *Lenzites vialis* Peck. A very widely distributed species, so variable that forms have been referred to three genera. Pileus brown, sometimes rather pallid, usually reddish or tawny, rough or uneven, somewhat pubescent, sometimes zoned; usually rather narrow and often much extended laterally. Hymenium pallid, or somewhat flesh-color or cinereous, or brownish like the substance of the pileus. *T. protracta* has pores of medium size, round; rather distant, hymenium tawny, according to Fries. For the other forms see under *D. pallido-fulva* and *L. vialis*.

The lenzitoid form is the commonest, according to Bresadola, who gives the spores as hyaline, 9 to 12 by $3\frac{1}{4}$ -4 μ .

T. funalis (Fr.) Ell. & Ev. Fibrous spongy, sessile, shell-form, ferruginous, almost entirely broken up into rough strand-like fibres which are rigid, branching and imbricated; pores thin, unequal, torn or toothed, pallid then fuscous. Sometimes pallid wood-color, with regular pores. Substance and spores colored.

T. Kansensis Cragin. Dimidiate, sessile, pitted, tumulous, somewhat sulcate near the acute margin, which is brownish, passing to grayish and blackish toward the centre; within light chestnut-brown; pore surface tawny, more or less convex, smooth to the touch, easily marked by the finger nail; pores long, unequal, entire, multiform, subrotund to sinuate, obtuse, rather distant, lined with whitish or grayish brown; trama yellowish in a narrow superficial zone. Kansas.

T. Petersii B. & C. Flattened, minutely tomentose, very pale tawny, somewhat sulcate or zoned at the margin, which is barren; pores punctiform, dissepiments rigid, obtuse. Alabama. Referred by Cooke to *Fomes*.

T. Pini (Brot.) Fr. Very hard, pulvinate, concentrically sulcate, rimose-scrupose, rough, fuscous-ferruginous becoming black, within tawny ferruginous; pores large, somewhat rounded or oblong, dull yellowish brick-color. On pine.

T. odorata (Wulf.) Fr. Softish, villous, at first tawny within, extended with age, concentrically sulcate, rugose, tomentose, dark brown to black, margin and pores roundish, oblong, tawny cinnamon. Odor pleasing.

T. rubescens (A. & S.) Fr. Reddish, or becoming so, all over, but white-pruinose when young, thin, smooth, at length zoned; pores linear, elongated, straight, narrow, obtuse. A form of *D. confragosa*, q. v.

E. *Pileus* or substance white, whitish, or pallid.

T. limitata B. & C. Small, roundish, thin, coriaceous, minutely tomentose, pallid, zoned; pores very small, distinctly angular when young, with thin dissepiments; margin thin, sterile. N. Mexico.

T. scutellata Schw. Small, an inch or less, dimidiate, orbiculate, or unguulate, commonly fixed by the apex; pilei very hard, white then brownish and blackish, becoming rugged and uneven, with white margin; hymenium disk-shaped, concave, white-pulverulent becoming dark; pores minute, long, with thick, obtuse dissepiments. On fence-rails, Ohio, etc.

T. Ohiensis Berk. Pulvinate, narrow, zoned, often laterally confluent, ochraceous white, tomentose, then glabrous laccate; otherwise as in the last of which it is said to be a synonym.

T. snaveolens (L.) Fr. Rather soft at first, pulvinate, white, villous, zoneless; pores rotund, rather large, obtuse, white then darker; anise scented. Common on willow.

T. odora Fr. Scarcely villous, and with minute, white-ochraceous very short pores; otherwise like the last. Willow.

T. lactea Berk. A common southern and tropical form, often very large, dull white, as if white-washed, more or less uneven, flattened, with a pale ochraceous pore-surface, is now, following Montagne and Berkeley, referred to *Daedalea ambigua* Berk. It is also known in literature as *T. ambigua* (Berk.) Fr., *T. incana* Berk., and as *T. Berkeleyi* Cooke. Its variety *coronata* Cragin "differs so remarkably in form" [from *T. ambigua*] as to deserve a name, in the author's opinion. It is higher than long, with the margin pinched off by a deep groove, and separated into four large, rounded, suberect lobes; near Topeka, Kansas.

DAEDALEA Pers.

Pores firm, sinuous or tortuous, even labyrinthiform (whence the name). Hard fungi, growing on wood, with a floccose substance which

descends unchanged into the trama. A genus midway between *Lenzites* and *Trametes*.

There are some species of *Polyporus* with sinuous or labyrinthiform pores; these, however, have narrow pores, and very thin dissepiments, without a conspicuous trama; and their substance is at first rather moist and spongy.

A. *Whitish, pallid, or fuscous etc., at least not as under B.*

D. ambigua Berk. Opaque white, as if whitewashed, zoneless, convex, glabrous, young parts sometimes pubescent; pore-surface pale tan or ochraceous, pores small, sinuose, edges obtuse, sometimes, however, with the character of *Lenzites* or of *Trametes*. A very common species in warm regions, distinguished mainly by the color of the pileus and pore-surface and by its white substance; it is often large, and generally flattened, and orbicular or reniform. Generally sessile, it sometimes has a short, often disc-like stem. The surface, occasionally somewhat shining, is often uneven and sulcate. The character of the hymenium is very variable, though often constant in a given locality, sometimes porous, again crowdedly lamelloid. The following are synonyms: *T. incana* Berk., *T. lactea* Berk., *T. ambigua* Fr., *L. glaberrima* B. & C., *D. glaberrima* B. & C. and probably *L. applanata* Fr., *L. repanda* Fr. and *D. applanata* Klotzsch.

D. glaberrima B. & C. Polished white, with a short, but evident stem. A form of *D. ambigua*.

D. quercina Pers. Pale wood-color, corky, rugulose, zoneless, uneven, rather smooth, of the same color within, porous at first; pores developing into winding or sinuate openings between contorted, thick, obtuse-edged lamellae. Our largest species; often imbricated and laterally extended. On oak chiefly, or chestnut.

D. plumbea Lév. Coriaceous, sessile, depressed, zonate, unequal, bare, lead-color, sinuses much like those of *D. quercina*, but darker; substance concolorous.

D. unicolor Fr. Villose-strigose, cinereous with concolorous zones; hymenium with flexuous, winding, intricate, acute dissepiments, at length torn and toothed. Very common on deciduous trees. Often imbricated, fuliginous when moist; pores whitish cinereous, sometimes fuscous, variable in thickness, color, and character of hymenium; sometimes with a white margin.

D. cinerea Fr. Thick subundulate, zonate, tomentose, cinereous; pores minute, obtuse, quite entire, some rounded, others very long, winding, flexuous, intricate, white or cinereous. Perennial, stratose, near *D. unicolor*.

D. tortuosa Cragin. Convex, often imbricated and confluent, strigose, pale yellowish brown, then smoother and paler, within concolorous, zonate; margin often ferruginous brown; hymenium pale cinnamon brown, generally effused at base, and abruptly subporous at the margin; sinuses intricate, flexuous, torn and toothed, differing from those of *D. unicolor* in size and color. Perhaps a form of *D. unicolor*.

D. subtomentosa Schw. Small, gibbous, whitish with raised subtomentose zones; sinuses poriform, narrow, white and pallid. Perhaps not distinct.

D. confragosa (Bolt) Pers. Somewhat convex, scabrous, subzonate, unicolorous, fuscous-brick-color, within wood-color, becoming ferruginous; hymenium porous, or narrowly labyrinthiform, cinereous-pruinose, then rufo-fuscous. On *Crataegus*, willow, and other trees.

Several forms, best referred to this very variable species, have been placed by different authors in *Lenzites* or *Trametes*. Among these are *Lenzites bicolor* Fr., probably; *L. Crataegi* Berk.; *L. Cookei* Berk.; *L. proxima* Berk.; *L. corrugata* Klotzsch; *Trametes rubescens* (A. & S.)

D. discolor Fr. Flat, rugose, scrupose, zoned, glabrate, whitish, within white, hymenium fuscous, porous, then narrowly sinuate, torn and toothed.

D. corrugata Berk. Fleshy, coriaceous, zoned, corrugated lengthwise, glabrous, pallid; sinuses unequal, flexuous, then torn, becoming fuscous. Imbricated sessile. According to Fries, perhaps a form of *D. discolor*.

D. albida Schw. Very flat, horizontal, zoned, very smooth, white; sinuses poriform and lamelliform, fuscous. Frequent on birch (says Schweinitz) in Carolina. Compare *D. discolor* and *D. corrugata*.

D. zonata Schw. Imbricated, flat, fuscous, zoned, undulate; sinuses mostly poriform. Forming conspicuous tufts on trunks, with pilei resembling oysters; near *D. albida*.

B. Yellowish, tawny, ferruginous etc.

D. puberula B. & C. Soft, corky, irregular, even, or with a few warty excrescences, finely pubescent, ochraceous, somewhat decurrent; margin thin; pores small, at length sinuate, concolorous.

D. aurea Fr. Gibbous, velvety, subzonate, golden-yellow, substance and pores yellow, hymenium porous or narrowly sinuate-labyrinthiform; margin swollen.

D. ferruginea Schum. Effused, reflexed, zoned, yellow-ferruginous, margins and young specimens white; within flesh-color; hymenium porous, then narrowly sinuate, tawny. Connate-imbricate. An uncertain species, reported from Pennsylvania many years ago. Perhaps a form of *D. unicolor*.

D. rhabarbarina Mont. Resupinate, long-effused, surrounding living branches, byssine, thick, yellow-tawny, radiate-fringed at the border; pores sinuous, obtuse, dark brown within.

D. Berkeleyi Sacc. Syll. Reniform, umber, zoned, sulcate, tomentose; margin obtuse, golden tawny; substance rhubarb-colored; hymenium ochraceous yellow; pores at length sinuate; dissepiments rigid, slightly pulverulent. Pine logs, Florida. The tawny orange marginal zone contrasts strongly with the dark umber pileus.

D. pallido-fulva Berk. Pallid, somewhat shining, zoneless; hymenium pale-tawny, pores mostly straight. Referred by some to *Trametes trabea* Pers., which (see *Lenzites vialis* Peck) this species probably is.

D. Ravenelii Berk. Ferruginous in the younger part, with sometimes a faint tawny tint; small, decurrent at the base, tomentose, becoming dark brown; pores irregular, at first pubescent.

D. sulphurella Peck. Resupinate, effused or nodulose, pale sulphur yellow, pores short, labyrinthiform, dissepiments often lacerated, as in *Irpex*, in the dry plant; encrusting decayed wood and mosses; becoming pallid on drying.

D. extensa Peck. Resupinate, thick, coriaceous, often uneven or somewhat nodulose, the margin at first cottony and white, soon changing to brown, the subiculum slightly rufescent; pores large, unequal, and labyrinthiform, in vertical places oblique, whitish. In long patches on under side of prostrate trunks.

D. merulioides Schw. Terrestrial, sessile; pileus pulvinate, somewhat fleshy behind, substipitate, extended; margin subundulate and as if auriculate about the pseudo-stipe, where it is white subtomentose, elsewhere glabrous, olivaceous cervine; hymenium of irregular pores, which are broad, as in *Merulius*, becoming yellowish, green, subangular, at first rather soft.

LENZITES Fr.

Corky, leathery, or woody, one-sided, sessile, variously attached; gills partaking of the same character as the pileus, firm, unequal, often anas-

tomosing or irregularly porous in places; spores white. Perennial or long persistent fungi, growing on trees or dead wood, closely related to the woody polypores through the genera *Daedalea* and *Trametes*. The distinction drawn by Fries between *Lenzites* and the polyporoid genera is that in the former a radial structure of hymenium is apparent from the first, whereas in the latter, the hymenium is porous in the beginning, as can be seen in young fruits or near the margins of more mature specimens.

A. *Generally whitish, pallid, grayish, etc., and plainly tomentose, velvety, or villous.*

L. albida Fr. Soft, flat, zoneless, milk-white, with a thin, appressed, silky-smooth tomentum; lamellae thin, dichotomous, anastomosing, entire, concolorous, effuso-reflexed (effused portion porous), often imbricated.

L. betulina (L) Fr. Pileus firm, obsoletely zonate, tomentose, pallid, often thick and rather hard at the back, thin at the margin; lamellae straight, somewhat branched, anastomosing, pallid or sordid; spores $4 \times 2 \mu$ (Massee). This is a species commonly reported. It is variable in color, and Peck has given a varietal name of *rufozonata* to a form with a markedly brown pileus with one or more reddish subglabrous zones. Old specimens are pale, or frequently greenish from the presence of a small alga, a not infrequent condition in other tomentose persistent fungi. Grows to several inches in extent, according to situation, and projects one or two inches. On birch and other deciduous trees.

L. flaccida Fr. is said to differ from the last by its thin *flaccid, zonate* pileus, which has been described as strigose, and as velvety hairy; by its broader, more crowded lamellae, which have a daedaleoid appearance at first; and by its spores, which are $7 \times 5 \mu$ (Massee). The pileus is narrowed behind to the point of attachment. Fries remarks that the gills do not anastomose, but are forked toward the base, at first white, then pallid, tinged with gray or brown. On deciduous trees. Forms which seem to be referable to this species rather than to the preceding should be studied carefully. Specimens of true *L. flaccida* are desired for the club herbarium.

L. ungulaeformis B & C. Hard, woody, dirty white, subtriquetrous, rather elongated, villous when young, but soon smooth and shining; surface unequal, once or twice sulcate, with some trace of the almost obliterated villosity towards the margin. Gills broad, thin, but woody, branched, and here and there forming sinuous pores. Allied to *L. betulina*, but more rigid.

L. heteromorpha Fr. Coriaceous, effuso-reflexed, thin, gibbous, fibrous-rugose, zoneless, pallid-whitish, margin incised on account of the very broad lamellae, which are crowded, somewhat branched, white and excurrent. A variable species known to Fries also in daedaleoid and trametoid forms. Var. *resupinata* Fr., is porous and resupinate.

L. variegata Fr. Coriaceous, rigid, plane, velvety, banded with zones of a different color, margin becoming white; lamellae broad, rather thick, unequal, anastomosing, white, edge at length acute, lacerate. A species easily distinguished by its resemblance above to *Polystictus versicolor*.

B. *Brown, tawny, ferruginous, etc., and generally not glabrous.*

L. saepiaria (Wulf.) Fr. Coriaceous, hard, zoned, strigose tomentose, scrupose, date-brown, margin and lamellae rather thick; lamellae branched, anastomosing, dull yellowish. Usually on pine. Hymenium very changeable, even entirely polyporoid, in which case it is *var. porosa* Peck; a resupinate form with lacerate anastomosing lamellae, resembling *Irpex* is *var. dentifera* Peck.

L. striata (Swartz) Fr. Coriaceous-soft, submembranaceous; pubescent, obsoletely zoned, ferruginous; lamellae thin, straight, unequal, somewhat anastomosing, cinereous or glaucous, edge acute, entire, or slightly crenulate or torn, fragile. According to Saccardo, certainly distinct from *L. saepiaria*, but very near *L. tricolor*.

L. tricolor (Bull.) Fr. Coriaceous, tough, zoned, silky or glabrate, smooth, dark cinnamon-brown; lamellae crowded, thin, ramose-furcate, wavy, dentate, dull yellow to pale cinnamon. Distinguished by the zones, which are hirsute or glabrous. The lamellae are porous, especially behind.

L. abietina (Bull.) Fr. Thin, effuso-reflexed, umber-tomentose, then becoming glabrous, hoary; lamellae decurrent, simple, unequal, pruinose becoming glaucous. Softer and thinner than *L. saepiaria*, and more extended sidewise. Lamellae sometimes dentate or lacerate, but scarcely porous.

L. rhabarbarina B. & C. Reniform, $1\frac{1}{4}$ in. across, $\frac{3}{4}$ in. long, zonate, rugose, velvety, then nearly smooth, rhubarb colored, at length marked with red bands; gills sub-ramose, lacerated at the margin. Allied to *L. abietina* (Bull.) Fr. Coriaceous, thin, effuso-reflexed, umber-tomentose, then becoming glabrous, hoary; lamellae decurrent, simple, unequal, pruinose-glaucous. Softer and smaller than *L. saepiaria*, usually extended laterally. Varies with lamellae dentate or lacerate, but hardly porous. On fir.

L. vialis Peck. Coriaceous, sessile, dimidiate or elongated, sometimes confluent, obscurely zoned, subtomentose, brown or grayish brown, the margin cinereous; lamellae thin, abundantly anastomosing, pallid, cinereous-pruinose on the edge when fresh. On old railroad ties. Not as brightly colored as *L. saepiaria*, nor so distinctly zoned; the lamellae are closer, thinner and more anastomosing, forming pores toward the outer margin. This is deemed by some authors to be a form of *Daedalea pallido-fulva*, q. v.

L. Berkeleyi Lév. Coriaceous, pliant, subreniform, sessile, hirsute, tawny, with prominent, crowded zones; lamellae very broad, distant, edge sharp, entire, yellow.

C. Usually glabrous, or nearly so; of various colors.

L. Klotzschii Berk. Sessile, roundish, thin, many-zoned, pale wood-color, at length brownish, glabrous, somewhat shining, or more or less rugulose; lamellae darker, thin, rigid, nearly entire, forked outwardly, sinuate-porous behind. (*D. discolor* Kl.); compare *D. confragosa*.

L. bicolor Fr. Rigid, reniform, sessile, pallid, very smooth, densely but slightly zoned, thin; lamellae unequal, crowded, dichotomous behind, connected by veins at the base, but not anastomosing, edge acute, entire, umber or blackish, paler on the sides. Compare *D. confragosa*.

L. Crataegi Berk. A form of *Daedalea confragosa*, on *Crataegus*, with smooth and shining surface concentrically sulcate. Hymenium brownish. Pores sinuous, elongated toward the centre, dissepiments thin and soft.

L. Cookei Berk. Rigid, thin, fawn-colored, somewhat rugose in lines, zonate. Substance varying from white to fawn color. Hymenium white, pores radiately elongated. A form of *D. confragosa*.

L. proxima Berk. Thin, applanate, slightly tomentose, umber. Substance soft, concolorous. Hymenium pallid, pores radiately elongated. A form of *D. confragosa*.

L. glaberrima B. & C., extended, rising from an orbicular disc, sulcate-zoned, whitish, very smooth; lamellae porous-anastomosing, crowded. A form of *Daedalea ambigua*.

Boston Mycological Club.

Bulletins No. 13 and 14. (Issued June 6, 1900.)

HOLLIS WEBSTER, Corr. Sec., P. O. Box 21, Cambridge, Mass.

The species of woody fungi which fall into the genera *Trametes*, *Daedalea*, and *Lenzites* are very naturally associated. In habit of growth, superficial appearance, and texture their resemblance is so evident as to suggest that they should be classed together. Owing, however, to the stress laid by systematists upon the form of the surface over which the layer of spore bearing cells, or hymenium, is spread, *Lenzites*, because of its lamellae, has generally been appended to the agarics, *Trametes* has been placed either with or closely following *Polyporus*, and *Daedalea* has been put near by. Such a separation is rendered inconvenient by the existence of many connecting forms, species of *Lenzites* frequently exhibiting more or less perfectly formed pores, while species of *Trametes*, and particularly of *Daedalea*, show more or less perfectly formed lamellae. Furthermore, the line between *Trametes* and *Polyporus* is by no means distinct.

In *Trametes*, as the name implies, the trama, or framework of the hymenium is well developed, and is plainly continuous with the substance of the pileus. This is generally evident to the eye, even without a hand lens, on examination of the face of a vertical section. Owing to the prominence of the trama, the pores are often small, and the partitions between the tubes are rather thick and obtuse. The tubes, too, are often rather long, and inserted at unequal depths, thus not forming a stratum well marked off from the substance of the pileus, as in *Polyporus*.

Daedalea includes those species, otherwise like *Trametes*, in which the pores are elongated and sinuous; but unless this character is marked, the advantage of drawing a line between the two is not obvious. The lengthening of the pores is generally greatest in lines radiating from the point of attachment of the pileus. Hence it is clear that a sufficient lengthening will eventually give us lamellae, which may be connected here and there by cross partitions. When such forms occur, if the lamellae are straight, we have something that must be referred to *Lenzites*.

Strictly defined, *Lenzites* would include only those forms in which the lamellae begin as radiating ridges, and would exclude forms which, starting with pores (*Trametes*) or with sinuses (*Daedalea*), eventually become lamelloid by the elongation vertically of the radiating partitions, and the disappearance of cross partitions, or anastomosing connections. In practice, however, these forms have been often referred to *Lenzites*.

In *Daedalea* and *Lenzites* the partitions, or lamellae, are often very thin, so that the trama is only evident at the point of attachment with the pileus. These forms approach, in this regard, the condition in those species of *Polyporus* proper in which the partitions are generally thin. Another complication comes in with differences of habit and habitat. The same species of *Daedalea* or *Trametes* may be, as in *Polyporus*, at one time resupinate, at another effused with reflexed margin, or again dimidiate and sessile or stipitate. The effused portion of a *Lenzites*, or an imperfectly developed, tubercular form, is usually porous.

These different tendencies in form of the hymenium appear sometimes in the same species, as for instance in *Daedalea ambigua* and *D. confragosa*. If the differences happen to be accompanied, as they often are, by slight variation in color, marking, texture, and proportions, the temptation to multiply species is great. Thus some authors separate, others unite, such series of forms, while others, knowing only a single

phase, perhaps only a single specimen, of a variable species, publish a description and a name based on such exceedingly fragmentary material.

It should then be evident that for the study of this group of fungi the first requisite is ample material, which should be gathered at different seasons, from different hosts, and in different habitats, until enough is accumulated to show the range of form that may be taken by each species. Although this will take time, it will add zest to collecting trips, and keep alive an interest in the commonest species.

The species included in this bulletin are in the main those ascribed to the United States in Saccardo's Sylloge. A few have been added, the descriptions of which are useful for comparison. The list is in no sense a list of American species; it is simply a compilation of those descriptions likely to be most needed for reference by a student new to the group. Where possible, original sources have been visited, but little attempt has been made to digest the material or to reconcile the synonymy.

For convenience the species under each genus have been grouped according to color and surface characters. Since these are variable in a given species, they must not be exclusively relied upon. Certain species, as will be seen, hardly lend themselves to this arrangement.

TRAMETES Fr.

Pores roundish, obtuse, entire, often unequal in depth and not forming a distinct stratum, at the base merged in the substance of the pileus, whence the trama is continuous with the substance of the pileus and similar to it. Woody or corky, growing on trees, becoming hard, but not stratose, often fragrant.

A genus distinguished from *Daedalea* by not having sinuous pores; and from *Polyporus* by not having a pore-stratum sharply distinct, by color and structure, from the substance of the pileus.

Resupinate or more or less effused (A and B).

A. *Pileus or substance brown or tawny.*

T. Abietis Karst. Triquetrous, dimidiate, base commonly effused, then entirely resupinate, forming roundish patches, often growing together or imbricated, tomentose and tawny when young, afterwards date brown or fuscous, scrobiculate or scrupose, finally becoming black, with a few concentric furrows; pores rather large, oblong or roundish, unequal, torn, tawny, hoary pubescent; spores spheroid, hyaline, 4 μ diam. On *Abies*. *Polystictus piceinus* Peck is said to be this species.

T. gausapata Berk. & Rav. Base effused, pilei reflexed, generally resupinate and confluent, velvety, zoned, dark reddish brown, coriaceous, (1 in. broad), substance fuscous; pore-surface pallid umber; pores at length angular, subacute ($\frac{1}{2}$ mm. diam.).

T. rigida Berk and Mont. Effused, slightly reflexed, often confluent, coriaceous-rigid, more or less concentrically sulcate, rugose, velvety, pale tawny wood-color, substance concolorous; pores small, roundish or slightly flexuous, pallid wood-color, edge obtuse. South.

B. *White, whitish, or pallid.*

T. radiciperda Hartig, which fruits on the roots of certain conifers, at or below the surface of the ground, and on the cut face of standing stumps (Hartig), is generally considered to be an irregular effused form of *Polyporus annosus* Fr. It appears in white, spreading, resupinate patches, with swollen sterile borders, forming a raised enclosure around the pore surface. Upper surface, when free, chocolate color, then darker,

zoned, edge white, generally very irregular, attached to sticks, dirt, etc.; when young slightly silky, later smooth, shining. With age the pores are filled up and become dark and sterile in patches, covered here and there by a new white hymenium; smell like that of *Boletus edulis*; texture of soft leather; pores at first .2 to .3 mm. broad.

T. mollis (Sommerf.) Fr. Resupinate, submembranaceous, pallid wood-color, then fuscous, margin at length revolute, dark and pubescent underneath; pores ample, unequal and torn. On maple, birch, etc.

T. serpens Fr. Dry, closely adnate-resupinate, erumpent, tuberculiform, orbicular, then confluent, white, border determinate, pubescent; pores roundish or angular, unequal, obtuse. At length paler.

T. sepium Berk. Effused at base, reflexed, often laterally confluent, finely tomentose, repeatedly zoned, pale wood-colored, coriaceous; substance white; hymenium pallid; pores slightly sinuated, about $\frac{1}{30}$ in. across. Widely distributed.

T. serialis Fr. Towy-corky, effuso-reflexed, seriatly extended, narrow, confluent, wrinkled and pitted with soft appressed hairs, white at first, then brown or brownish red; margin obtuse; pores obtuse, minute, unequal, white. Commonly resupinate. On spruce.

T. versatilis Berk. Long effused, margin broadly reflexed, whitish, extremely thin, flexible, clothed with coarse down, silky towards the margin, which is acute and pale bay; pores nearly of the color of the margin, deep, regular at first, then variously sinuated; dissepiments toothed, elongated, longest towards the base. Louisiana.

Distinctly pileate, but in some cases effused at base (C, D, and E).

C. Pileus covered with hairs.

T. hydroides (Swartz) Fr. Flat, zoneless, dark bay or brown, covered with rigid branching dark hairs; within ferruginous; pores minute, rounded, equal, obtuse, ferruginous. Very common in warm regions. Often becoming nearly bald with age; variable in color, size, and thickness.

T. Feathermanni Rav. is said to be a form of the last, very dark, coriaceous, with thick hairs.

T. Trogii Berk. Fuscous, subolivaceous; pileus convex, at first smoothish, unequal, then covered with rigid hairs 3 lines long, and somewhat zonate, margin acute, substance white; pores somewhat angular, toothed. Dead poplar. Eur.

T. Peckii Kalchbr. Sub-decurrent, brownish ferruginous, becoming pale, hairy, zoneless, margin acute; substance wood-color, pores rather large, rounded angular, nearly concolorous, or becoming brown. Hairs longer, pores larger and darker than in the American form of *T. Trogii*. Distinguished by the seal brown hairs. West. Said to be *T. funalis* (Fr.) Ell. & Ev.

T. Lindheimeri B. & C. A southern species, pale tawny, plane, covered with soft matted strigose hairs, with thin margin and pores at length dingy umber, of medium size, slightly angular, dissepiments thin, often elongated into teeth, is now referred to *Polystictus* (Cooke).

D. Pileus or substance brown, brownish, or tawny.

T. trabea (Pers) Bres. = *T. protracta* Fr. = *Daedalea pallido-fulva* Berk. = *Lenzites vialis* Peck. A very widely distributed species, so variable that forms have been referred to three genera. Pileus brown, sometimes rather pallid, usually reddish or tawny, rough or uneven, somewhat pubescent, sometimes zoned; usually rather narrow and often much extended laterally. Hymenium pallid, or somewhat flesh-color or cinereous, or brownish like the substance of the pileus. *T. protracta* has pores of medium size, round, rather distant, hymenium tawny, according to Fries. For the other forms see under *D. pallido-fulva* and *L. vialis*.

The lenzitoid form is the commonest, according to Bresadola, who gives the spores as hyaline, 9 to 12 by $3\frac{1}{4}$ -4 μ .

T. funalis (Fr.) Ell. & Ev. Fibrous spongy, sessile, shell-form, ferruginous, almost entirely broken up into rough strand-like fibres which are rigid, branching and imbricated; pores thin, unequal, torn or toothed, pallid then fuscous. Sometimes pallid wood-color, with regular pores. Substance and spores colored.

T. Kansensis Cragin. Dimidiate, sessile, pitted, tumulous, somewhat sulcate near the acute margin, which is brownish, passing to grayish and blackish toward the centre; within light chestnut-brown; pore surface tawny, more or less convex, smooth to the touch, easily marked by the finger nail; pores long, unequal, entire, multiform, subrotund to sinuate, obtuse, rather distant, lined with whitish or grayish brown; trama yellowish in a narrow superficial zone. Kansas.

T. Petersii B. & C. Flattened, minutely tomentose, very pale tawny, somewhat sulcate or zoned at the margin, which is barren; pores punctiform, dissepiments rigid, obtuse. Alabama. Referred by Cooke to Fomes.

T. Pini (Brot.) Fr. Very hard, pulvinate, concentrically sulcate, rimose-scrupose, rough, fuscous-ferruginous becoming black, within tawny ferruginous; pores large, somewhat rounded or oblong, dull yellowish brick-color. On pine.

T. odorata (Wulf.) Fr. Softish, villous, at first tawny within, extended with age, concentrically sulcate, rugose, tomentose, dark brown to black, margin and pores roundish, oblong, tawny cinnamon. Odor pleasing.

T. rubescens (A. & S.) Fr. Reddish, or becoming so, all over, but white-pruinose when young, thin, smooth, at length zoned; pores linear, elongated, straight, narrow, obtuse. A form of *D. confragosa*, q. v.

E. *Pileus* or substance white, whitish, or pallid.

T. limitata B. & C. Small, roundish, thin, coriaceous, minutely tomentose, pallid, zoned; pores very small, distinctly angular when young, with thin dissepiments; margin thin, sterile. N. Mexico.

T. scutellata Schw. Small, an inch or less, dimidiate, orbiculate, or ungulate, commonly fixed by the apex; pilei very hard, white then brownish and blackish, becoming rugged and uneven, with white margin; hymenium disk-shaped, concave, white-pulverulent becoming dark; pores minute, long, with thick, obtuse dissepiments. On fence-rails, Ohio, etc.

T. Ohiensis Berk. Pulvinate, narrow, zoned, often laterally confluent, ochraceous white, tomentose, then glabrous laccate; otherwise as in the last of which it is said to be a synonym.

T. suaveolens (L.) Fr. Rather soft at first, pulvinate, white, villous, zoneless; pores rotund, rather large, obtuse, white then darker; anise scented. Common on willow.

T. odora Fr. Scarcely villous, and with minute, white-ochraceous very short pores; otherwise like the last. Willow.

T. lactea Berk. A common southern and tropical form, often very large, dull white, as if white-washed, more or less uneven, flattened, with a pale ochraceous pore-surface, is now, following Montagne and Berkeley, referred to *Daedalea ambigua* Berk. It is also known in literature as *T. ambigua* (Berk.) Fr., *T. incana* Berk., and as *T. Berkeleyi* Cooke. Its variety *coronata* Cragin "differs so remarkably in form" [from *T. ambigua*] as to deserve a name, in the author's opinion. It is higher than long, with the margin pinched off by a deep groove, and separated into four large, rounded, suberect lobes; near Topeka, Kansas.

DAEDALEA Pers.

Pores firm, sinuous or tortuous, even labyrinthiform (whence the name). Hard fungi, growing on wood, with a floccose substance which

descends unchanged into the trama. A genus midway between *Lenzites* and *Trametes*.

There are some species of *Polyporus* with sinuous or labyrinthiform pores; these, however, have narrow pores, and very thin dissepiments, without a conspicuous trama; and their substance is at first rather moist and spongy.

A. *Whitish, pallid, or fuscous etc., at least not as under B.*

D. ambigua Berk. Opaque white, as if whitewashed, zoneless, convex, glabrous, young parts sometimes pubescent; pore-surface pale tan or ochraceous, pores small, sinuose, edges obtuse, sometimes, however, with the character of *Lenzites* or of *Trametes*. A very common species in warm regions, distinguished mainly by the color of the pileus and pore-surface and by its white substance; it is often large, and generally flattened, and orbicular or reniform. Generally sessile, it sometimes has a short, often disc-like stem. The surface, occasionally somewhat shining, is often uneven and sulcate. The character of the hymenium is very variable, though often constant in a given locality, sometimes porous, again crowdedly lamelloid. The following are synonyms: *T. incana* Berk., *T. lactea* Berk., *T. ambigua* Fr., *L. glaberrima* B. & C., *D. glaberrima* B. & C. and probably *L. applanata* Fr., *L. repanda* Fr. and *D. applanata* Klotzsch.

D. glaberrima B. & C. Polished white, with a short, but evident stem. A form of *D. ambigua*.

D. quercina Pers. Pale wood-color, corky, rugulose, zoneless, uneven, rather smooth, of the same color within, porous at first; pores developing into winding or sinuate openings between contorted, thick, obtuse-edged lamellae. Our largest species; often imbricated and laterally extended. On oak chiefly, or chestnut.

D. plumbea Lév. Coriaceous, sessile, depressed, zonate, unequal, bare, lead-color, sinuses much like those of *D. quercina*, but darker; substance concolorous.

D. unicolor Fr. Villose-strigose, cinereous with concolorous zones; hymenium with flexuous, winding, intricate, acute dissepiments, at length torn and toothed. Very common on deciduous trees. Often imbricated, fuliginous when moist; pores whitish cinereous, sometimes fuscous, variable in thickness, color, and character of hymenium; sometimes with a white margin.

D. cinerea Fr. Thick subundulate, zonate, tomentose, cinereous; pores minute, obtuse, quite entire, some rounded, others very long, winding, flexuous, intricate, white or cinereous. Perennial, stratose, near *D. unicolor*.

D. tortuosa Cragin. Convex, often imbricated and confluent, strigose, pale yellowish brown, then smoother and paler, within concolorous, zonate; margin often ferruginous brown; hymenium pale cinnamon brown, generally effused at base, and abruptly subporous at the margin; sinuses intricate, flexuous, torn and toothed, differing from those of *D. unicolor* in size and color. Perhaps a form of *D. unicolor*.

D. subtomentosa Schw. Small, gibbous, whitish with raised subtomentose zones; sinuses poriform, narrow, white and pallid. Perhaps not distinct.

D. confragosa (Bolt) Pers. Somewhat convex, scabrous, subzonate, unicolorous, fuscous-brick-color, within wood-color, becoming ferruginous; hymenium porous, or narrowly labyrinthiform, cinereous-pruinose, then rufo-fuscous. On *Crataegus*, willow, and other trees.

Several forms, best referred to this very variable species, have been placed by different authors in *Lenzites* or *Trametes*. Among these are *Lenzites bicolor* Fr., probably; *L. Crataegi* Berk.; *L. Cookei* Berk.; *L. proxima* Berk.; *L. corrugata* Klotzsch; *Trametes rubescens* (A. & S.)

D. discolor Fr. Flat, rugose, scrupose, zoned, glabrate, whitish, within white, hymenium fuscous, porous, then narrowly sinuate, torn and toothed.

D. corrugata Berk. Fleshy, coriaceous, zoned, corrugated lengthwise, glabrous, pallid; sinuses unequal, flexuous, then torn, becoming fuscous. Imbricated sessile. According to Fries, perhaps a form of *D. discolor*.

D. albida Schw. Very flat, horizontal, zoned, very smooth, white; sinuses poriform and lamelliform, fuscous. Frequent on birch (says Schweinitz) in Carolina. Compare *D. discolor* and *D. corrugata*.

D. zonata Schw. Imbricated, flat, fuscous, zoned, undulate; sinuses mostly poriform. Forming conspicuous tufts on trunks, with pilei resembling oysters; near *D. albida*.

B. *Yellowish, tawny, ferruginous etc.*

D. puberula B. & C. Soft, corky, irregular, even, or with a few warty excrescences, finely pubescent, ochraceous, somewhat decurrent; margin thin; pores small, at length sinuate, concolorous.

D. aurea Fr. Gibbous, velvety, subzonate, golden-yellow, substance and pores yellow, hymenium porous or narrowly sinuate-labyrinthiform; margin swollen.

D. ferruginea Schum. Effused, reflexed, zoned, yellow-ferruginous, margins and young specimens white, within flesh-color; hymenium porous, then narrowly sinuate, tawny. Connate-imbricate. An uncertain species, reported from Pennsylvania many years ago. Perhaps a form of *D. unicolor*.

D. rhabarbarina Mont. Resupinate, long-effused, surrounding living branches, byssine, thick, yellow-tawny, radiate-fringed at the border; pores sinuous, obtuse, date brown within.

D. Berkeleyi Sacc. Syll. Reniform, umber, zoned, sulcate, tomentose; margin obtuse, golden tawny; substance rhubarb-colored; hymenium ochraceous yellow; pores at length sinuate; dissepiments rigid, slightly pulverulent. Pine logs, Florida. The tawny orange marginal zone contrasts strongly with the dark umber pileus.

D. pallido-fulva Berk. Pallid, somewhat shining, zoneless; hymenium pale-tawny, pores mostly straight. Referred by some to *Trametes trabea* Pers., which (see *Lenzites vialis* Peck) this species probably is.

D. Ravenelii Berk. Ferruginous in the younger part, with sometimes a faint tawny tint; small, decurrent at the base, tomentose, becoming dark brown; pores irregular, at first pubescent.

D. sulphurella Peck. Resupinate, effused or nodulose, pale sulphur yellow, pores short, labyrinthiform, dissepiments often lacerated, as in *Irpex*, in the dry plant; encrusting decayed wood and mosses; becoming pallid on drying.

D. extensa Peck. Resupinate, thick, coriaceous, often uneven or somewhat nodulose, the margin at first cottony and white, soon changing to brown, the subiculum slightly rufescent; pores large, unequal, and labyrinthiform, in vertical places oblique, whitish. In long patches on under side of prostrate trunks.

D. merulioides Schw. Terrestrial, sessile; pileus pulvinate, somewhat fleshy behind, substipitate, extended; margin subundulate and as if auriculate about the pseudo-stipe, where it is white subtomentose, elsewhere glabrous, olivaceous cervine; hymenium of irregular pores, which are broad, as in *Merulius*, becoming yellowish, green, subangular, at first rather soft.

LENZITES Fr.

Corky, leathery, or woody, one-sided, sessile, variously attached; gills partaking of the same character as the pileus, firm, unequal, often anas-

anastomosing or irregularly porous in places; spores white. Perennial or long persistent fungi, growing on trees or dead wood, closely related to the woody polypores through the genera *Daedalea* and *Trametes*. The distinction drawn by Fries between *Lenzites* and the polyporoid genera is that in the former a radial structure of hymenium is apparent from the first, whereas in the latter, the hymenium is porous in the beginning, as can be seen in young fruits or near the margins of more mature specimens.

A. Generally whitish, pallid, grayish, etc., and plainly tomentose, velvety, or villous.

L. albida Fr. Soft, flat, zoneless, milk-white, with a thin, appressed, silky-smooth tomentum; lamellae thin, dichotomous, anastomosing, entire, concolorous, effuso-reflexed (effused portion porous), often imbricated.

L. betulina (L) Fr. Pileus firm, obsoletely zonate, tomentose, pallid, often thick and rather hard at the back, thin at the margin; lamellae straight, somewhat branched, anastomosing, pallid or sordid; spores $4 \times 2 \mu$ (Masse). This is a species commonly reported. It is variable in color, and Peck has given a varietal name of *rufozonata* to a form with a markedly brown pileus with one or more reddish subglabrous zones. Old specimens are pale, or frequently greenish from the presence of a small alga, a not infrequent condition in other tomentose persistent fungi. Grows to several inches in extent, according to situation, and projects one or two inches. On birch and other deciduous trees.

L. flaccida Fr. is said to differ from the last by its thin *flaccid*, *zonate* pileus, which has been described as strigose, and as velvety hairy; by its broader, more crowded lamellae, which have a daedaleoid appearance at first; and by its spores, which are $7 \times 5 \mu$ (Masse). The pileus is narrowed behind to the point of attachment. Fries remarks that the gills do not anastomose, but are forked toward the base, at first white, then pallid, tinged with gray or brown. On deciduous trees. Forms which seem to be referable to this species rather than to the preceding should be studied carefully. Specimens of true *L. flaccida* are desired for the club herbarium.

L. ungulaeformis B & C. Hard, woody, dirty white, subtriquetrous, rather elongated, villous when young, but soon smooth and shining; surface unequal, once or twice sulcate, with some trace of the almost obliterated villosity towards the margin. Gills broad, thin, but woody, branched, and here and there forming sinuous pores. Allied to *L. betulina*, but more rigid.

L. heteromorpha Fr. Coriaceous, effuso-reflexed, thin, gibbous, fibrous-rugose, zoneless, pallid-whitish, margin incised on account of the very broad lamellae, which are crowded, somewhat branched, white and excurrent. A variable species known to Fries also in daedaleoid and trametoid forms. Var. *resupinata* Fr., is porous and resupinate.

L. variegata Fr. Coriaceous, rigid, plane, velvety, banded with zones of a different color, margin becoming white; lamellae broad, rather thick, unequal, anastomosing, white, edge at length acute, lacerate. A species easily distinguished by its resemblance above to *Polystictus versicolor*.

B. Brown, tawny, ferruginous, etc., and generally not glabrous.

L. saepiaria (Wulf.) Fr. Coriaceous, hard, zoned, strigose tomentose, scrupose, date-brown, margin and lamellae rather thick; lamellae branched, anastomosing, dull yellowish. Usually on pine. Hymenium very changeable, even entirely polyporoid, in which case it is *var. porosa* Peck; a resupinate form with lacerate anastomosing lamellae, resembling *Irpex* is *var. dentifera* Peck.

L. striata (Swartz) Fr. Coriaceous-soft, submembranaceous, pubescent, obsoletely zoned, ferruginous; lamellae thin, straight, unequal, somewhat anastomosing, cinereous or glaucous, edge acute, entire, or slightly crenulate or torn, fragile. According to Saccardo, certainly distinct from *L. saepiaria*, but very near *L. tricolor*.

L. tricolor (Bull.) Fr. Coriaceous, tough, zoned, silky or glabrate, smooth, dark cinnamon-brown; lamellae crowded, thin, ramose-furcate, wavy, dentate, dull yellow to pale cinnamon. Distinguished by the zones, which are hirsute or glabrous. The lamellae are porous, especially behind.

L. abietina (Bull.) Fr. Thin, effuso-reflexed, umber-tomentose, then becoming glabrous, hoary; lamellae decurrent, simple, unequal, pruinose becoming glaucous. Softer and thinner than *L. saepiaria*, and more extended sidewise. Lamellae sometimes dentate or lacerate, but scarcely porous.

L. rhabarbarina B. & C. Reniform, $1\frac{1}{4}$ in. across, $\frac{3}{4}$ in. long, zonate, rugose, velvety, then nearly smooth, rhubarb colored, at length marked with red bands; gills sub-ramose, lacerated at the margin. Allied to *L. abietina* (Bull.) Fr. Coriaceous, thin, effuso-reflexed, umber-tomentose, then becoming glabrous, hoary; lamellae decurrent, simple, unequal, pruinose-glaucous. Softer and smaller than *L. saepiaria*, usually extended laterally. Varies with lamellae dentate or lacerate, but hardly porous. On fir.

L. vialis Peck. Coriaceous, sessile, dimidiate or elongated, sometimes confluent, obscurely zoned, subtomentose, brown or grayish brown, the margin cinereous; lamellae thin, abundantly anastomosing, pallid, cinereous-pruinose on the edge when fresh. On old railroad ties. Not as brightly colored as *L. saepiaria*, nor so distinctly zoned; the lamellae are closer, thinner and more anastomosing, forming pores toward the outer margin. This is deemed by some authors to be a form of *Daedalea pallido-fulva*, q. v.

L. Berkeleyi Lév. Coriaceous, pliant, subreniform, sessile, hirsute, tawny, with prominent, crowded zones; lamellae very broad, distant, edge sharp, entire, yellow.

C. Usually glabrous, or nearly so; of various colors.

L. Klotzschii Berk. Sessile, roundish, thin, many-zoned, pale wood-color, at length brownish, glabrous, somewhat shining, or more or less rugulose; lamellae darker, thin, rigid, nearly entire, forked outwardly, sinuate-porous behind. (*D. discolor* Kl.); compare *D. confragosa*.

L. bicolor Fr. Rigid, reniform, sessile, pallid, very smooth, densely but slightly zoned, thin; lamellae unequal, crowded, dichotomous behind, connected by veins at the base, but not anastomosing, edge acute, entire, umber or blackish, paler on the sides. Compare *D. confragosa*.

L. Crataegi Berk. A form of *Daedalea confragosa*, on *Crataegus*, with smooth and shining surface concentrically sulcate. Hymenium brownish. Pores sinuous, elongated toward the centre, dissepiments thin and soft.

L. Cookei Berk. Rigid, thin, fawn-colored, somewhat rugose in lines, zonate. Substance varying from white to fawn color. Hymenium white, pores radiately elongated. A form of *D. confragosa*.

L. proxima Berk. Thin, applanate, slightly tomentose, umber. Substance soft, concolorous. Hymenium pallid, pores radiately elongated. A form of *D. confragosa*.

L. glaberrima B. & C., extended, rising from an orbicular disc, sulcate-zoned, whitish, very smooth; lamellae porous-anastomosing, crowded. A form of *Daedalea ambigua*.

Boston Mycological Club.

Bulletins Nos. 15 and 16. (Issued June, 1901.)

HOLLIS WEBSTER, Cor. Sec'y., P. O. Box 21, Cambridge, Mass.

COPRINUS.

The prominent generic character is the solution of the gills at maturity into a dripping, inky fluid. The spores are black when seen in the mass, of some shade of brown when seen by transmitted light. The majority of the species grow upon dung or richly manured ground, as the generic name implies (from *κόπρος*, dung.). Most of the species are so unsubstantial as to be valueless for food, but probably none are poisonous, and certain of the larger species are among the best of edible fungi; the latter, if used for food should be gathered while young, and promptly cooked, as they quickly deliquesce. In the following descriptions the term *veil* refers to the universal veil or volva, which envelops the entire plant in the young state, and on expansion of the plant by growth remains more or less persistently in the form of scurf, scales, or patches on the surface of the pileus and stipe; the use of the term *volva* is restricted to that portion of the volva or universal veil, which sometimes remains after rupture sheathing the base of the stipe; there is no trace of a secondary veil in any known species of *Coprinus*, and therefore a true ring is never present on the stipe, the structure so called being the free margin of the volva, which is torn away and carried up for some distance on the growing stipe. The reference given with each species is to the place where the original description may be found. Masee's revision of the genus in *Annals of Botany*, 10 : 123 has been freely consulted, and the classification there adopted followed. The following descriptions are of species that the writer has seen reported as having been found in the United States.

Boston, June 10, 1901.

EDWIN A. DANIELS, M. D.

Section I. Volva distinct, with a free margin.

C. sterquilinus Fr. Ep. 242. Pileus conic-ovate, then campanulate, coarsely sulcate, silvery-gray, disk tawny and covered with squarrose squamules, 5-7 cm. high; gills free, purplish-black; spores 18-20 \times 11-12 μ ; stipe 9-15 cm. high, fibrillose, white, becoming dark-colored when bruised, volva adnate, its margin free and sometimes carried up as a ring. On dung and manured ground.

C. stenocoleus Lindbl. in Fr. Mon. 2 : 306. Fr. Icon. 104, f. 1. Pileus, except the disk, membranaceous, cylindrical then campanulate, livid-black, variegated with white flocci; stipe hollow, slender, base incrassate and closely sheathed by a long volva, having its margin free; gills free, linear, black. On manured ground. Stipe 4'-6' long, 1''-2'' thick above. Pileus at last lacerated or entire, revolute. Spores black, 20-25 \times 12.5 μ .

Section II. Volva absent; ring present (volva really present, but closely adnate, peronate).—A. Large; pileus 8-15 cm. high.

C. comatus Fr. Ep. 242. Pileus oblong or nearly cylindrical, then campanulate or expanded and split on the margin, whitish, even, then becoming broken up into scattered, more or less reflexed, large torn scales; gills slightly adnexed, crowded, white then tinged with red or pink, becoming black and dripping an inky fluid; stipe stout, white or whitish, volva usually evanescent, its free margin forming a ring which is often carried up by the elongating stipe; spores black, 12-14 \times 8-10 μ . Pileus 9-15 cm. high; stipe 12-20 cm. long. Gregarious on rich soil. One of the best of edible fungi.

C. ovatus Fr. Ep. 242. Pileus about 2' across when expanded, ovate

then expanded, covered with an even pale-ochraceous cuticle, which becomes broken into large concentric scales, white between the scales, the apical portion remaining intact like a cap, margin striate, flesh thin; gills free, very remote, lanceolate, about 2'' broad, whitish then blackish-umber; stipe 3'-5' long, 6'' thick or more at the swollen base, flocculose or fibrillose, white, hollow, bulbous portion solid, ring deciduous, spores 11-12 \times 7-8 μ . In pastures, etc. Edible.

C. atramentarius Fr. Ep. 243. Pileus at first ovate, then expanded, glabrous or with a few obscure spot-like scales in the center, grayish-brown; gills free, crowded, at first whitish and flocculose on the edge, then purplish-brown or black; stipe glabrous, hollow, white or whitish; spores elliptical, black, 7.5-10 μ . Margin of pileus sometimes irregularly notched or lobed, stipe sometimes has a slight vestige of a collar near the base. Pileus 1'-3' or more broad, stipe 2'-4' long, 1''-2'' thick. It grows in clusters in rich soil in late summer and autumn. Edible. *Var. silvestris*, grows in woods, is generally smaller and more beautiful.

C. soboliferus Fr. Ep. 243. Pileus 1.5'-2.5' across, subcylindrical, then ovato-campanulate, usually undulate toward margin, not sulcate nor striate, disk truncate, usually depressed, squamulose, dingy-white, tinged with pale brown towards the apex, squamules darker, flesh very thin; gills free, lanceolate, 3'' or more broad, crowded, pale then blackish; stipe 5'-8' long, 9'' thick at the base, slightly attenuated upwards, silky, white, stuffed, having a depressed zone near the base caused by the edge of the young pileus, ring fugacious; spores elliptical, 15 \times 7 μ . Amongst grass near trunks, buried wood, etc.

B. Small; pileus not exceeding 3 cm. high.

C. squamosus Morg. Cinn. Soc. Nat. His. 6 : 173. Pileus somewhat membranaceous, ovoid then expanded, cinereous, covered with reddish-brown scales; stipe hollow, rather equal, covered below ring with reddish-brown scales like the pileus, above ring smooth and white; gills free, ventricose, white then reddish-brown becoming black; spores cymbiform 20-22.5 μ . Caespitose. In woods. Pileus about 1' high, expanded 1.5'-2.5' broad, split and revolute, stipe 4'-6' long, about 3'' thick.

C. variegatus Pk. N. Y. St. Mus. Nat. His. 25 : 79. Pileus fragile, oblong-ovate then campanulate, obtuse, hygrophanous, pale watery brown when moist, whitish or cream-colored when dry, variegated with ochraceous tomentose scales, margin finely striate; gills lanceolate, crowded, ascending, free, white then rosy-brown becoming black; stipe equal, brittle, hollow, white, at first peronate-annulate the slight ring soon disappearing, then floccose-pruinose with white branching root-like threads at the base; spores subelliptical, 9 μ . Densely caespitose, 3'-5' high, pileus 1'-1.5' broad, stipe 2''-4'' thick. Thin soil and decaying leaves.

C. quadrifidus Pk. Rep. N. Y. St. Mus. Nat. His. 50 : 106. Pileus thin, at first oval, then campanulate, becoming more or less expanded with revolute margin, with a superficial floccose-tomentose veil, which soon separates into evanescent flakes, finely striate, whitish becoming grayish or grayish-brown, margin often wavy or irregular; gills broad, thin, crowded, free, whitish then dark purplish-brown becoming black; stipe equal or slightly tapering upwards, hollow, floccose-squamulose, white, sometimes with a slight, evanescent ring near the base; spores 7.5-10 \times 4-5 μ . Gregarious or caespitose, pileus 2'-3' broad, stipe 3'-4' long, 3''-4'' thick. Under basswood trees. June. Pileus becomes perforated in the center and soon splits into 3-5, commonly 4 segments, the divisions extending a short distance down the stipe.

C. Hendersonii Berk. Flo. Brit. 5 : 122. Extremely tender; pileus 4''-6'' broad, at first subcylindric, granulose under a lens, apex brownish, shaded into cinereous towards the margin, at length plano-convex; margin folded; gills rather distant, free, powdered with the black spores, edges

white, narrow, at length appearing like mere wrinkles; stipe 1.5' long, not a line thick, white, nearly or quite smooth, hollow, attenuated upwards, with a cup-shaped, more or less distant, permanent ring. Spores 10–12 \times 6 μ . On hot beds and on dung in fields.

C. bulbilosus Pat. Tab. Anal. Fung. 60, fig. 658. Pileus convex, margin striate, incurved then expanding, gray, disk tinged yellow, covered with white meal, 8–10 mm. across; gills gray; spores oval, 8–9 \times 6–7 μ ; stipe 2–3 cm. long, slender, white, base bulbous, ring loose. On horse-dung.

C. ephemeroïdes Fr. Ep. 250. Pileus cylindric-ovate, then campanulate, plicato-sulcate, whitish or livid, disk tinged yellow, sprinkled with superficial flecks, up to 1 cm. high and broad; gills free, remote; spores elliptical, 11–12 \times 6–7 μ , stipe 2–4 cm. long, whitish, with a free ring usually placed some distance up the stipe, base with a pilose bulb. On dung.

Section III. Volva and ring absent. Veil practically absent. Pileus either glabrous, or with minute innate squamules especially near the apex. Usually large and closely allied to Sect. II.

A. Gills attached to the stipe.

C. fuscescens Fr. Ep. 244. Pileus 1'–1.25' across, submembranaceous, ovato-expanded, dull, disk rather fleshy, even or cracked into squamules, grayish-brown, disk rufous; gills adfixed, blackish-umber; stipe 4'–5' long, about 3'' thick, equal, fragile, hollow, subfibrillose, ring indistinct or absent, whitish; spores elliptical, apiculate, 10 \times 6 μ . Dead trunks, etc.

C. insignis Pk. Rep. N. Y. St. Mus. Nat. His. 26:60. Pileus campanulate, thin, sulcate-striate to the disk, grayish-brown, smooth, disk sometimes cracking into small areas or scales; gills ascending, crowded; stipe hollow, slightly fibrillose, striate, white; spores rough, 10 \times 7 μ . Plant 4'–5' high, pileus 2'–3' broad, stipe 3'' thick. About roots of trees in woods.

C. tergiversans Fr. Ep. 247. Pileus conical, then expanded, silky, soon grooved, cracked up into minute squamules, rusty-brown, disk darker, even, 6–12 cm. broad and high; gills broadly adnate; spores 10 \times 4 μ ; stipe white, equal, glabrous, apex sulcate, 10–14 cm. long. Caespitose.

B. Gills free.

C. flocculosus Fr. Ep. 245. Pileus ovate then expanded, dirty-white, striate, with innate squamules, 4–7 cm. across; gills free, narrow; spores 10 \times 7–8 μ ; stipe 6–10 cm. high, white, silky, shining, hollow. On ground in fields, etc. Solitary or tufted.

C. stenophyllus Mont. Syl. 132 n. 410. Gregarious, ephemeral; pileus ovoid then campanulate and expanded, sparsely covered with ochraceous scales, rufous then fuliginous, broadly umbonate, margin at length revolute and deeply split, striatulate, 5–7 cm. broad; stipe cartilaginous, elongated, hollow, naked, even, white, base incrassate; gills free, narrow, crowded, very thin, lurid then fuscous-black; spores fuscous, ovoid. On ground from decaying wood.

C. macrosporus Pk. Rep. N. Y. St. Mus. Nat. His. 31:35. Pileus ovate, then expanded, rimose-striate, obscurely floccose-squamulose, white, the small even brownish disk squamose; gills crowded, free, white then black; stipe glabrous, white, with traces of a ring near the thickened base; spores very large, elliptical, 20–25 \times 12.5–16 μ . Caespitose, 2'–3' high, pileus 1'–2' broad, stipe 1'' thick. Ground in open fields.

Section IV. Volva and ring absent; veil very evident, at least in the young state, in the form of a felt-like layer which breaks up during expansion into irregular patches, cottony, squamulose, fibrillose or mealy, but not glistening or micaceous.

A. Veil rather thick, breaking up into more or less persistent patches.

C. sulcatus McClatchie, Proc. So. Calif. Acad. Sci. 1:381. Pileus obtusely conic then campanulate, with a thick white floccose veil that breaks

up into thin irregular patches, watery-white becoming white or cream-colored when dry, sulcate nearly to disk, 10–30 mm. high and broad; gills adnate, elliptical, margins silvery-white when young; spores broadly elliptical, brownish-black, $10 \times 11-16 \mu$; stipe fibrous, hollow, pruinose then glabrous, 25–75 mm. long, 3–4 mm. thick. In decaying straw.

C. picaceus Fr. Ep. 244. Pileus ovate then campanulate, glutinous, striate to the disk, blackish, at first with a white felty layer which becomes broken into patches, 4–7 cm. across; gills free; spores $14 \times 8 \mu$; stipe 10–15 cm. long, white, smooth, hollow, base swollen. On the ground.

C. bulbosus Pk. Bull. Tor. Bot. Cl. 22: 491. Pileus thin, campanulate, cuticle breaking into broad, superficial, persistent, whitish scales, somewhat striate, grayish brown, marg. at length revolute, lacerated; gills narrow, thin, crowded, free, slate-colored becoming black; stipe equal, hollow, white; spores elliptical, $7\frac{1}{2}-10 \times 5 \mu$. Pileus 2'–3' broad, stipe 3'–6' long, 2''–3'' thick. Caespitose, at base of cottonwood stumps.

C. tomentosus Fr. Ep. 246. Pileus 1'–1.5' high, submembranaceous, cylindrical, then conical, then expanded and splitting, striate, pale gray, with a velvety floccose layer becoming torn into persistent patches; gills free, narrow, brownish then blackish-brown, stipe about 2' long, 2'' thick, equal, velvety, grayish, hollow. On dung and in rich pastures.

C. calyptratus Pk. Bull. Torr. Bot. Club, 22: 205. Pileus when mature with a few floccose scales and crowned with a persistent stellately split, membranous, dingy-yellow or subtawny calyptra, radiate-striate to the disk, grayish-flocculent along the edges of the striae, blackish; gills free, dark lead colored becoming black; stipe equal, hollow, white, becoming blackish in drying except at base; spores elliptical, black, $15-20 \mu$. Pileus about 2' broad, stipe 3'–4' long, 2''–3'' thick. Open cultivated ground.

C. laceratus Pk. Bull. Torr. Bot. Club, 26: 68. Pileus thin, at first ovate and covered with a white separable floccose coat, which soon separates into scales or patches and finally disappears, then campanulate, striate nearly to the center, much torn or lacerated on margin, pale buff becoming darker; gills thin, close, free, white becoming black; stipe equal or slightly thickened at the base, striate, hollow, white; spores elliptical, $12-15 \times 8-10 \mu$. Pileus 2.5–4 cm. broad, stipe 5–7.5 cm. long, about 4 mm. thick. Caespitose. On manure.

B. Veil breaking up into superficial scales, cottony or fibrillose.

*a. Gills attached to the stipe. — * Pileus whitish or gray.*

C. niveus Fr. Ep. 246. Pileus .5'–1' across, submembranaceous, elliptical, then campanulate and expanded, almost persistently covered with snow-white floccose down; gills slightly attached, narrow, becoming blackish; stipe 1.5'–3' long, subequal, or slightly attenuated upwards, villose, white, hollow; spores $16 \times 11-13 \mu$. On dung, especially of horses.

C. Brassicae Pk. Rep. N. Y. St. Mus. Nat. His. 43: 18, Pl. 2, f. 9–14. Pileus membranaceous, at first ovate or conical, then broadly convex, squamulose, finely striate to the disk, white becoming grayish-brown, margin generally splitting and becoming recurved; gills narrow, crowded, reaching the stipe, brown with a slight ferruginous tint; stipe slender, glabrous, hollow, slightly thickened at the base, white; spores elliptical, brown, $7.5 \times 5 \mu$. Pileus 4''–5'' broad, stipe 8''–10'' long. On decaying stems of cabbage.

** * Pileus tawny or brownish.*

C. domesticus Fr. Ep. 251. Pileus 1.5'–2' across, thin, ovate, then campanulate, obtuse, furfuraceous-squamulose, smoke-colored or pale grayish-white, disk brown, undulato-sulcate, splitting; gills adnexed, crowded, narrow, reddish-white, then blackish-brown; stipe 2'–3' long, 2''–3'' thick, slightly attenuated upwards, adpressed-silky, white, hollow; spores $14-16 \times 7-8 \mu$. On rotten wood, damp carpets, walls, etc. Caespitose.

C. laniger Pk. Bull. Torr. Bot. Cl. 22:491. Pileus thin, conical or campanulate, with tawny, tomentose or floccose scales, which partly or wholly disappear, sulcate-striate, pallid, tawny or grayish ochraceous; gills whitish then brownish-black; stipe slightly thickened at the base, pruinose, hollow, white; spores oblong-elliptical, $7.5-10 \times 4 \mu$. Pileus 6''-12'' broad, stipe about 1' long, 1''-2'' thick. Caespitose, at base of cottonwood stumps.

C. Seymouri Pk. Rep. N. Y. St. Mus. Nat. His. 28:49. Caespitose, fragile. Pileus thin, soon expanded, smooth, or sprinkled with minute granular scales, dark brown, disk sometimes with reddish tinge, strongly striate or subplicate, margin thin, soon revolute and splitting; gills close, narrow, reaching the stipe, brown then black; stipe equal, hollow, smooth or slightly pulverulent, white; spores broadly ovate, $6-7.5 \times 5-6 \mu$. Compressed, 3'-4' high, pileus 8''-12'' broad, stipe 1'' thick. Clay soil. Oct.

C. granulosus Clem. Univ. Nebr. Bot. Surv. Rep. 2:39. Pileus membranaceous, ovoid-oblong, at length campanulate, closely radiate-sulcate, furfuraceous, pale yellowish-brown, umbo prominent, translucent, flavofuscous, at first covered with more or less persistent coarse brown granules; stipe white, hollow, equal, everywhere persistently pruinose; gills ventricose, brown then black, touching, at length free; spores oblong-elliptical, brownish-purple, 1-2 guttulate, $8-10 \times 5-6 \mu$. Wet ground in greenhouse.

C. virgineus Bann. in Pk. Rep. N. Y. St. Mus. Nat. His. 44:71. Pileus ovate, campanulate or cylindrical, pale ochre-colored, margin thin, torn, floccose; gills narrow, close, forked, white becoming dark but never black, adnexed; stipe 3.5' long, stout, somewhat stuffed, attenuated at apex, flattened, floccose, spores black. Caespitose or gregarious.

*b. Gills free. — * Stipe glabrous.*

C. nycthemerus Fr. Ep. 251. Pileus 6''-8'' broad when expanded, membranaceous, at first conico-cylindrical, then expanded and splitting, floccose-mealy, radiately plicate, margin striate, striae furcate, then naked, gray, disk tawny; gills free, at length remote, narrow, blackish; stipe 2'-3' long, equal hollow, flaccid, whitish, glabrous; spores $9 \times 6 \mu$. On dung and manured ground. Subcaespitose.

C. subglobatus B. & C. Proc. Amer. Acad. Arts & Sci. 1858:118. Pileus hemispherical then expanding, almost even, pale brown, covered with a thick whitish downy veil, about 4-5 cm. across; gills free, broad, white then dusky-purple; spores elliptical, $7-8 \mu$, stipe white, equal, slightly curved, hollow, smooth, 6-8 cm. long. On banks.

C. arenatus Pk. Rep. N. Y. St. Mus. Nat. His. 46:27. Pileus thin, at first broadly ovate or sub-hemispherical, soon convex or campanulate, with small white tomentose scales, which soon disappear, striate on the margin, whitish or grayish-white becoming grayish-brown; gills broad, crowded, free, grayish-white, soon purplish-brown, then black, with projecting hyaline cystidia; stipe short, equal, glabrous, hollow, white; spores subglobose, $7.5-8 \times 6-7.5 \mu$. Pileus 1'-2' broad, stipe 1'-2' long, 1''-2'' thick. Solitary or gregarious, on sandy soil. May. Mycelium binds sand into a globular mass at base of stipe.

C. Spragueii B. & C. Ann. Nat. His. Oct. 1859. Pileus 6''-9'' broad, membranaceous, conical, then campanulate, becoming expanded and revolute, tomentose, grayish, disk tawny, margin coarsely striate; stipe 1.5'-2' long, about 1'' thick, equal, smooth, pale cinnamon, hollow; gills free, few, distant, narrow, white becoming blackish; spores elliptical; slightly curved, $10 \times 5 \mu$. On the ground.

C. rotundosporus Pk. Rep. N. Y. St. Mus. Nat. His. 31:35. Pileus thin, campanulate, whitish or pale cinereous, with thin, floccose, subpersistent tomentum, even; gills free; stipe slightly tapering upwards, white; spores subglobose, $7.5-8.75 \mu$. Plant 2'-3' high, pileus about 1' broad. About roots of trees in woods.

* * *Stipe floccose or pulverulent at first.*

C. lagopus Fr. Ep. 250. Pileus 1'-2' across, cylindrical then campanulate, covered with white flocculent down, becoming glabrous, striate-sulcate to disk, splitting, whitish, disk brownish; gills free, at length remote, narrow becoming black; stipe elongated, usually equally attenuated upwards, white, everywhere white-floccose, hollow, fragile; spores 14-16 \times 10-12 μ . On rotten wood, dung, etc.

C. lagopides Karst. Hattsv. 1:535. Pileus very thin, campanulate, sulcate, grayish, disk livid, ornamented with free white scales joined by hairs, 4-7 cm. broad; gills remote, black; spores 6-8 \times 5-6 μ ; stipe up to 17 cm. high, white, floccose, hollow. On ground among poplars.

C. fimetarius Fr. Ep. 245. Pileus 1'-2' across, clavate then conico-expanded, soon split and revolute, grayish, apex tinged with brown, white-floccose, then naked, rimoso-sulcate, disk even, flesh thin; gills free, lanceolate, about 2'' broad, then linear and wavy, black; stipe 5'-6' long, 2''-3'' thick, hollow squamulose, base thickened and solid; spores 12-14 \times 7-8 μ ; cystidia large. On manure-heaps, etc. Solitary or clustered.

Var. cinereus Fr. Pileus at first with feathery squamules, stipe short, rooting. Paler and smaller than the typical form. *Var. macrorhiza* Fr. Pileus at first with feathery squamules, stipe short, rooting; paler and smaller than type.

C. Jonesii Pk. Bull. Torr. Bot. Club. 22:206. Pileus submembranaceous, campanulate becoming broadly convex or expanded and split or revolute on margin, very blunt or truncate at the apex when young, covered with tawny-gray or pale-cervine floccose scales, which wholly or partly disappear with age, revealing the striate surface beneath; gills crowded, linear, free, white or whitish becoming black; stipe equal or slightly tapering upwards, minutely floccose, hollow, white; spores black, broadly elliptical, with apiculus at one end; 7.5-9 \times 6 μ . Pileus 1'-2' broad, stipe 2'-3' long, 2''-3'' thick. Fragile, sometimes caespitose.

C. plumbeus Pk. Rep. N. Y. St. Mus. Nat. His. 29:42. Pileus submembranaceous, fragile, campanulate, sulcate-striate, leaden-gray, tawny or brownish-yellow on the small disk, sprinkled with tawny-cinereous hairs or flocci; gills narrow, close, free; stipe slightly tapering upwards, hollow, floccose, white; spores elliptical, 10 \times 6 μ . Plant 3'-5' high, pileus 1'-1.5' broad, stipe 1''-2'' thick. Ground in wood roads.

C. Veil formed of white meal or hyaline vescicles (not micaceous).

C. filiformis B. & Br. Ann. & Mag. Nat. His. Ser. 3, 7:7. Pl. 15, f. 8. Pileus cylindrical, gray, covered with white mealy particles, striate, 1-2 mm. high; gills linear; spores subglobose, 5 \times 4 μ ; stipe 1-1.5 mm. high, extremely slender, hyaline, sprinkled with short, delicate hairs. On ground in woods.

C. semilanatus Pk. Rep. N. Y. St. Mus. Nat. His. 24:71. Pl. 4, f. 15-18. Pileus submembranaceous, convex, then expanded and revolute, sometimes split, farinaceo-atomaceous, finely and obscurely rimose-striate, pale grayish-brown: gills narrow, close, free; stipe elongated, fragile, hollow, slightly tapering upward, white, lower half clothed with loose cottony flocci which rub off easily, upper half smooth or slightly farinaceous; spores broadly elliptical, 12.5 μ . Very fragile, 4'-6' high, pileus 8''-12'' broad, stipe 1'' thick at the base. Rich ground and dung.

Section V. Volva and ring absent. Pileus covered with glistening micaceous particles when young.

C. micaceus Fr. Ep. 247. Pileus thin, at first ovate, then campanulate or expanded, striate, sometimes glistening with shining particles when young, buff or tawny-yellow; gills crowded, whitish, then tinged with pinkish or purplish-brown, then black; stipe slender, fragile, hollow, white; spores elliptical, brown, 6.25-7.5 μ . Pileus 1'-2' broad, stipe 1'-3'

long, rarely thicker than a pipe-stem. Grows in large clusters on ground or on decaying wood. May to November. Edible. *Var. granularis* Pk. Rep. 47:42. Pileus sprinkled with granules or furfuraceous scales.

C. stercorarius Fr. Ep. 251. Pileus ovate then campanulate, margin striate, densely covered with white glistening meal, 2.5–3 cm. high and broad; gills adnexed; spores $14-15 \times 8 \mu$; stipe 7–12 cm. long, white, minutely mealy at first, hollow. On dung, manured ground &c.

Section VI. Volva, ring, and veil entirely absent; flesh exceedingly thin; pileus becoming split along the lines of the gills; scurfy or glabrous.

A. Pileus more or less scurfy. — a. Gills attached to the stipe.

C. apiculatus Pk. Bull. Torrey Bot. Club. 22:206. Pileus membranaceous, campanulate or deeply convex, acute or apiculate, furfuraceous, plicate-striate to the disk, grayish; gills few, subdistant, reaching the stipe, black; stipe filiform, glabrous, white; spores elliptical, black, $7.5 \times 4 \mu$. Pileus about 3" broad, stipe 1'–1.5' long, scarcely .5" thick.

C. aquatilis, Pk. Rep. N. Y. St. Mus. Nat. His. 27:96, Pl. 1, f. 26–28. Pileus membranaceous, campanulate, sulcate-plicate almost to apex, furfuraceous, yellowish-brown; gills subdistant, reaching the stipe, brownish, then black; stipe slender, equal, hollow, furfuraceous, whitish; spores elliptical, $10.25 \times 7.5 \mu$. On sticks and twigs partly submerged, or lying in wet, mossy places. Young plant more yellow than the mature.

C. velox Godey, in Gill. Champ. Fr. Hym. 614 with fig. Pileus obovate, striate, then grooved, scurfy between the ribs, disk also grayish and scurfy, 3–4 mm. across; gills close to the stipe; stipe 1.5–3 cm. long, covered with delicate white floccose down, base with radiating fibrils. On cow dung.

C. ephemerus Fr. Ep. 252. Pileus 6"–9" across, very thin, ovate then campanulate, finally expanded and splitting, radiato-sulcate, at first slightly furfuraceous, disk elevated, even, rufescent; gills slightly attached, linear, white then brownish, then blackish; stipe 1.5'–2.5' high, 1" or more thick, equal, glabrous, pellucid, hollow, whitish; spores $16-17 \times 9-10 \mu$. On dung-hills, manured ground, etc. Appears almost glabrous, but under lens seen to be distinctly scurfy. Extremely fugacious.

C. mycenopsis Karst. Symb. Myc. Fenn. 8:8. Pileus campanulate, then expanded, sulcate, sooty-gray, the livid disk prominent, scurfy at first, soon naked, 3–7 cm. across; gills adnate, purple, then brown; spores $7-8 \times 4 \mu$; stipe up to 14 cm. long, glabrous (apex slightly flocculose), striate upwards, white, hollow. In meadows.

C. Berkeleyi, Mont. Syl. 131. Pileus cylindrical, ovate then campanulate, delicately striate, scurfy, yellowish or grayish-brown, then blackish, 3.5 cm. high, 5 cm. broad; gills adnexed, very narrow; stipe up to 15 cm. long, cartilaginous, variegated with yellowish-green and rufous, hollow, glabrous, base thickened. On rotten wood.

b. Gills free.

C. sulphureus McClatchie, Proc. So. Calif. Acad. Sci. 1:381. Pileus oblong-campanulate, becoming expanded with revolute margins, grayish or yellowish-brown, finely striate, villous, 20–35 mm. high before expansion; gills free, linear, 1–2 mm. broad, with sulphureous margins; spores elliptical, $8 \times 15-18 \mu$; stipe clothed with yellowish cobweb-like hairs attenuate upwards, hollow, 50–75 mm. long, 3–4 mm. thick. Among decaying leaves under trees.

C. Wrightii B. & C. Cent. N. A. F. n. 84. Pileus 3"–4" broad, at first oval, then flat and expanded, radiato-striate, glaucous-gray with small brown chaffy specks; stipe 2' high, whitish, smooth, pellucid, fistulose, attached by a little down at the base; gills moderately distant, narrow, free, dark-gray; spores subcymbiform, 10μ .

C. radiatus Fr. Ep. 251. Pileus 2"–3" across, exceedingly delicate and ephemeral, cylindrical, then campanulate becoming plane, at first covered

with a grayish down, soon splitting, radiately plicate, yellowish, disk tawny; gills free, few and distant, narrow, blackish; stipe 3''-12'' high, filiform, hyaline, becoming glabrous, whitish; spores 7-8 \times 5 μ . On dung, especially on horse-dung.

B. Pileus glabrous.

*a. Gills attached to the stipe. — * Stipe downy or pulverulent.*

C. sclerotigenus E. & E. Microscope, 1890 : 129 with fig. Pileus ovoid or ovoid-oblong, then campanulate, blackish-brown, apex tinged whitish, about 1 cm. high and broad; gills adnexed; spores obliquely elliptical, 8-10 \times 5-6 μ ; stipe 2.5-10 cm. high, slender, subequal, usually straight above and more or less flexuous below where it is downy. Springing from an irregularly subglobose, rugulose sclerotium, which is black externally, white inside. On sheep's dung. Montana.

** * Stipe glabrous.*

C. congregatus Fr. Ep. 249. Pileus 6''-9'' high, cylindrical then campanulate, finally expanded and split at the margin, smooth, viscid, margin slightly striate, ochraceous; gills about 1'' broad, slightly adnexed, white, becoming black; stipe 1'-1.5' long, equal, smooth, hollow, whitish. On ground, also in hot-houses, etc. Densely caespitose.

C. silvaticus, Pk. Rep. N. Y. St. Mus. Nat. His. 24 : 71. Pl. 4, f. 10-14. Pileus membranaceous, with a thin fleshy disk, convex, plicate striate on margin, dark brown, the depressed striae paler; gills subdistant narrow, attached to stipe, brownish; stipe fragile, slender, smooth, hollow, white; spores gibbous ovate, 12.5 μ . Plant 2' high, pileus, 6''-10'' broad, stipe .5'' thick. On ground in woods. Sept.

C. angulatus Pk. Rep. N. Y. St. Mus. Nat. His. 26 : 60. Pileus submembranaceous, hemispherical or convex, plicate-sulcate, disk smooth; lamellae subdistant, reaching the stipe, whitish then black; stipe equal, smooth, whitish; spores compressed, angular, subovate 10 \times 8 μ ; plant 1'-2' high, pileus 6''-12'' broad, stipe .5'' thick. In woods.

b. Gills free.

C. plicatilis Fr. Ep. 252. Pileus 8''-12'' across, membranaceous, ovate-cylindrical, then campanulate becoming plane, margin splitting and revolute, sulcate to the disk, almost glabrous, brown then grayish, the disk darker, broad, even, and at length depressed; gills attached to a collar, remote, narrow, distant, grayish-black; stipe 2'-3' long, about 1'' thick, equal, white, smooth, hollow; spores 12-14 \times 8-10 μ , fugacious.

C. deliquescens Fr. Ep. 249. Pileus 1.5'-3' across, ovato-campanulate then expanded, flesh rather thick at disk, distantly striate, glabrous, except the minutely papillose disk, livid gray or smoky, disk often tinged rufescent; gills free, at length remote, narrow, gray, then blackish; stipe 3'-4' high, about 3'' thick, whitish, glabrous, hollow, subequal or slightly attenuated upwards; spores elliptical, obliquely apiculate, 8 \times 5 μ . On trunks, stumps, heaps of dead leaves, etc. Slightly caespitose.

Species excluded.

C. pulchrifolius Pk. Rep. N. Y. St. Mus. Nat. His. 29 : 41. Pileus membranaceous, conical or campanulate, striate to the small yellowish disk, cinereous, sprinkled with minute whitish scales or granules; lamellae narrow, crowded, free, cinnamon-brown, often with a few minute hyaline spine-like processes; stipe slender, fragile, hollow, white; spores elliptical, brown with slight rosy tinge, 7.5 μ . Plant solitary, 2'-3' high; pileus 6''-12'' broad; stipe scarcely 1'' thick. Ground in woods. Sept. Does not accord well with genus *Coprinus*, as spores are brown and gills not deliquescent, nor with *Psathyra* for gills are free, pileus not hygrophanous, nor with *Psathyrella* for gills are free and spores brown. Resembles *Coprinus* most. (Masseé suggests that it may be a *Bolbitius*.)

Boston Mycological Club.

Bulletins Nos. 17 and 18. (Issued December, 1901.)

HOLLIS WEBSTER, Cor. Sec'y., P. O. Box 21, Cambridge, Mass.

Numerous requests for opinions in regard to some recent books on mushrooms may conveniently be answered by reference to the following reviews. The first appeared in the American Kitchen Magazine, the others in Rhodora, The Journal of the New England Botanical Club.

BOOK REVIEWS.

One Thousand American Fungi. By Charles McIlvaine and Robert K. Macadam, pp. 704, \$12.00. Bowen, Merrill Co., Indianapolis, Ind.

Within its splendid bulk, "sumptuous" is perhaps the publishers' usual adjective, the book contains a preface, in which the author refers to his labors for twenty years in testing the edible qualities of all toadstools that came his way, and to his desire to put the results of his experience, certainly the widest of any mycophagist that ever lived, at the service of all lovers of mushrooms; an introduction which sets forth valuable advice for the protection of the novice, and briefly expounds the nature of toadstools, and the way they are classified; instructions as to collection and study; a valuable key to the abbreviations of the authors of species; a text embodying descriptions of one thousand species systematically arranged, with notes of the author's experience with each; numerous recipes for preparation and cooking; a useful—in fact, indispensable glossary; and various indices: in all over seven hundred pages, which, as bound, tip the scale at an even eight pounds. Interspersed are some excellent half-tones, many less excellent colored illustrations, and numerous cuts, making in all nearly two hundred "plates."

In spite of its unwieldiness the book is a helpful addition to the works of reference available for amateurs, so many of whom are being blindly led to the study of mushrooms. Its helpfulness is due to the fact that it contains a greater number of descriptions and figures of our American toadstools than have before been collected in one volume, and to the various carefully made diagrams illustrative of points in structure and classification which must be mastered before any attempt is made at identification of species. The elucidation of generic characteristics by means of parallel series of outline drawings, elaborated from the plan in Worthington Smith's "Clavis Agaricinarum" is well done, though it makes prominent the loss of clearness due to the latter day departure from Fries's simpler arrangement, which was rather more intelligible to a beginner, even if unsatisfactory to modern systematists. Further help is promised in the preface from simplification of the technical language of the descriptions; but it may be questioned whether this does not sometimes cause a regrettable lack of precision.

Evidence of rather mechanical and undigested compilation is shown in the handling of the keys introduced under some of the genera. They seem to have been taken without change from the Reports of the New York State Botanist, and consequently do not give clues to a number of species included, which are thus in danger of being overlooked. It is to be regretted that the author did not make good keys for all the genera, and curtail the unnecessary length of many of his notes, in which, owing

to compilations from various sources, valuable space is occupied by needless repetition.

The colored illustrations are not successful. To familiar species they give an unfamiliar look, and for beginners can only be misleading. Yet there are one or two marked exceptions to this valuation of them, as for example the plate of *Clitocybe illudens*. The half-tones are excellent and well present a number of species. That labeled "Phallus impudicus" is indeed so good that by using the analytical key to the Phalloideæ given on a neighboring page, the species represented may be at once easily identified as *Dictyophora Ravenelii*. *Ithyphallus impudicus* is, in fact, very rare, though its name, as in this instance, is frequently given to a common and widely distributed species.

Such a slip as the one just mentioned unfortunately raises a serious doubt as to the reliability of the author's determination of unfamiliar species in all cases. In this matter no one is infallible, but it is a little disquieting to think that the remarks as to edibility appended to the descriptions may after all not always apply to the species described, but rather to some other erroneously identified. This doubt is strengthened by an amazing observation under *Amanita Frostiana*, where the bad reputation of *Russula emetica* is ascribed to the possible confusion of that *Russula* with the *Amanita*. One would really like to hear what Fries would have to say to such a mad suggestion.

On the whole, amateurs may, with perseverance and caution, which they must use with any books, get from Mr. McIlvaine's volume more information than from any other single book in the field at present. It is ardently to be hoped, however, that a handier manual, less ambitious in some ways and more comprehensive, may be issued before many years. Many students will be sorry that the assistant author, Mr. Macadam, evidence of whose painstaking labor is not wanting in many details of the performance, could not have influenced Mr. McIlvaine to assemble from original sources descriptions of all the toadstools and related fungi found in America, and publish them as an American Sylloge, after the plan of Saccardo. That, if accurately done, would have been a permanently useful work, whereas the present volume must soon find itself supplanted. Still, we must be grateful for notes as to actual experiments on the edibility of so many species, and that is, after all, what the author aimed to give us, and what will secure for his labors the reputation which they deserve.

Studies of American Fungi. Mushrooms Edible, Poisonous, etc. By George Francis Atkinson, Professor of Botany in Cornell University, Ithaca, N. Y., Andrus and Church, 1900; 275 pages, 200 illustrations from photographs, besides colored plates and other figures. \$3.00.

Mr. Atkinson's book makes immediately a favorable impression by the number and excellence of its illustrations. They are from photographs taken by the author and represent over one hundred and fifty species as they actually look in nature—lacking, of course, the color. To color, however, it must be said, a beginner is prone to give much too great importance, not having any experience with its variability in these plants. Thus it is no real disadvantage to the student to be forced to attend to details of texture and structure, such as the camera can faithfully record. Particularly is this true in the first steps of study, when attention must be paid to characteristics by which genera are discriminated, for in the acquirement of facility to distinguish one genus from another, color, except that of the spores, plays a small part. It is one of the objects of the author, as he states

in his introduction, to present typical forms of nearly all of the genera of the gilled mushrooms, and he has succeeded admirably. His material is well chosen, and there is abundance of it, some common species, such as *Agaricus campestris*, *Amanita phalloides*, *A. muscaria*, and *Coprinus comatus*, being shown at different stages of development and in a variety of aspects. The few colored plates attempted are on the whole acceptable, but we can be glad that they are not more numerous.

It is evident, however, from a study of Mr. Atkinson's plates, as it has been from the photographs of Mr. Lloyd of Cincinnati, that the camera can be relied on for more than generic distinctions. Except in a small percentage of cases, a good photograph will preserve even the individuality of a species. To attain this object, care and skill must be shown in the collection and arrangement of material, as in Mr. Atkinson's work. With such photographs, for instance, as those of *Hydnum coralloides*, *H. erinaceus*, and *H. caput-ursi*, in the hands of amateurs, we may hope that the reports of finding *H. caput-Medusae* will become much less frequent.

There is strong inclination, then, to speak only in praise of Mr. Atkinson's illustrations. If fault were to be found at all, it would be with figures 85 (*Armillaria mellea*), 123 (*Cantharellus cibarius*), and 201 (*Dictyophora duplicata*), which certainly do not adequately present these species.

The descriptive part of the text is much more than a running accompaniment to the illustrations. Most of the descriptions are from actual observations of the author, and are not mere copies of the stingy, technical diagnoses of ordinary systematic works. Besides ample notes of color, structure, variability, habitat, etc., are frequently appended details of microscopic structure. It must be said, however, that comparison of related species would be facilitated by greater fullness in some cases. Why, for example, may we not have the spore-measurements of *Amanita phalloides* to compare with those of *A. floccoccephala*? To be sure the measurements of other observers can easily be referred to, but we want to compare Mr. Atkinson with Mr. Atkinson.

Besides the systematic part of the book, which forms the bulk of the volume, there are introductory chapters on structure and development, copiously illustrated, the substance of which has already appeared in the Bulletins of the Cornell University Agricultural Experiment Station. There are also chapters on "The Collection and Preservation of the Fleshy Fungi," on the "Selection and Preservation of Mushrooms for the Table," on "Recipes for Cooking Mushrooms" (by Mrs. Sarah Tyson Rorer), on the "Chemistry and Toxicology of the Fungi" (by J. F. Clark), and on "Structural Characters" (by H. Hasselbring), all of which are admirable in their way and increase the value of the book to people at large.

In spite of its good qualities, the book as a whole somehow lacks symmetry and unity. It is not aimed at any one class of readers. In the main intended for popular use, it yet contains, perhaps to the surprise of some botanists, descriptions of several proposed new species, though the first medium at hand has often enough before been utilized for such a purpose. Ordinary readers, too, can hardly be interested in illustrations of such species as *Boletus obsonium*, *Pleurotus sulphuroides*, and *Armillaria aurantia*, especially when they will search the pages in vain for many of the commonest species which awaken prompt inquiry, the moment the eager mushroom hunter gets his eyes open. Scant mention of species, such as often occurs, as on pages 48 (*Panaeolus fimicola*, etc.) 90 (*Clitocybe cyathiformis*) 152 (*Pholiota aurivella*), and elsewhere, is of no possible use in such a book. It gives no information to anybody. A puzzle in synonymy is offered to inexperienced readers on pages 16 and 17, where the

bewildering nature of the "ambiguous trametes" is exemplified by treating it as *Trametes* in the text, and as *Daedalea* in the accompanying figure — all without a word of explanation. This is the more remarkable in view of the absence of any treatment (other than this brief obscure mention of a single species) of the common genera *Trametes*, *Daedalea*, and *Lenzites*, and is one of the many indications that might be cited that the book has been hurried to publication before all the matter that properly belongs in such a popular exposition of the more important genera was assembled.

To insist on the absence of a definite plan in the book, other than that of getting a certain amount of available material between two covers and thus catching the market, would perhaps be unjust in view of what is told us in the introduction, where the author says :

"Since the issue of my 'Studies and Illustrations of Mushrooms,' . . . there have been so many inquiries for them and for literature dealing with a larger number of species, it seemed desirable to publish in book form a selection from the number of illustrations of these plants which I have accumulated during the past six or seven years."

Yet, by the author's own admission, the contents of the book are to some extent the result of accident. In this respect the book compares unfavorably with Cooke's well known "British Edible Fungi," which selects a few conspicuous species, or even with Mr. McIlvaine's tome, which attempts to include all American fungi known to be edible.

Passing from general considerations to the criticism of certain details, such as the spelling of generic and specific names, we find too many examples of unscholarly oversight and error. Some instances of carelessness in the proof reading are conspicuous, as *ENTOMOLA* p. 143, and again on p. 144 ; *fuligineus*, *hygrophanus* (as English words) p. 266. Other errors can hardly be set down to the same cause, particularly when the inaccuracies of the text are accurately reproduced in the legends of the plates and in the index. The following may be cited: *Amanita caesaria* (caesarea), p. iv, and pl. 19 ; *Hebeloma crustinuliforme* (— tulin —), p. 158 and fig. 148; *Pluteus tomentosulus* (— ulus) p. 139, 140; *Boletus luridis* (— us), p. 249 (three times); *Annelaria* (Anellaria) p. 265. And furthermore what is to be thought of the following ? — *Tricholoma aurantia*, p. 86, *Calostoma cinnabarina*, p. 212, 213, and pl. 72. Yet we find the author on page 168 holding up his hands (if that be the interpretation of his exclamation point) at Mr. Lloyd's "*Flammula rhodoxanthus*!"

Of minor importance, yet perhaps worth a comment, is the inconsistency shown in retaining Vittadini's original spelling *rachodes* in (*Lepiota rhacodes*) while changing Fries's *pargamenus* (in *Polystictus pergamenus*). Is it not better to spell *rhacodes* correctly ?

Nine "new species" are described and illustrated: *Amanita floccocephala*, *A. velatipes*, *A. cothurnata*, *Lepiota asperula*, *Mycena cyanothrix*, *Hypholoma rugocephalum*, *Bolbitius variicolor*, *Paxillus corrugatus*, and *Hydnum putidum*. Of certain of these a fuller discussion would be welcome. *Amanita floccocephala*, for instance, does not stand out clearly from *A. phalloides*; *A. cothurnata*, suggests Peck's *A. crenulata*, both in description and figures; *Mycena cyanothrix* seems too close to *M. cyaneobasis* Peck, which is admittedly near *M. calorhiza* Bres., a species identified by some with *M. Iris* Berk.; yet there is nothing to show that the older species were studied in connection with the forms proposed as new.

To the great and increasing number of people who want information about our mushrooms Mr. Atkinson's "Studies" will be as helpful as any single book obtainable. It is certainly the best collection yet published of illustrations of our species.

Among the Mushrooms. A Guide for Beginners. By Emma L. Dallas and Caroline A. Burgin, Philadelphia, 1900; Drexel Biddle, Publisher. pp. 175, \$2.00.

To amateurs of mushrooms, who have found the literature of the subject at times hopeless and dreary, a little volume recently published in Philadelphia should bring recreation and entertainment. Inspired to see, with Emerson, that "a poor fungus or mushroom . . . is the symbol of the power of kindness," the authors of the modest volume were led by the difficulties that beset the path to knowledge to think of the trials and distress of others that might follow in their footsteps. How could they help them? "This little book is the answer." "Let us give our own experience," they said, and they have told it in language as simple as it is diverting.

To review the book seriously would be cruel. It is not meant to be reviewed, but to be read and enjoyed, in the spirit in which the authors carried on their studies. By quotation, however, the true value of the book to the weary student can, perhaps, be indicated. "We began for pleasure and recreation, but it became irksome and fatiguing, and the subject which might have amused us . . . is put aside and abandoned."

The introduction transports us from "the bustling, noisy streets of a city into the quiet fields and woods, where the bright-hued mushrooms" invite us to "the discovery of new specimens, the learning of their names, the knowledge of their curious organizations" which "will all add an interest to our lives." "Among the fallen leaves—peers out a bright yellow mushroom." We dig it up. "We have brought a basket and trowel and can examine them thoroughly."

From the woods we pass presently to the study, to learn that "Fungi have existed from early geological ages," the oldest known Hymenomycete, being the one that "was called *Polyporites Bowmanii*." "It is interesting to know that even before the Tertiary period the undergrowth consisted of ferns and fleshy fungi. What a time of delight for the botanist! But there were no human beings in those days to roam amongst that luxuriant undergrowth, and only the fossil remains in the deposits of coal and peat are left to tell of their former existence." Alas! Untimely fate of early man!

Under various heads follows much information as to structure, habit, etc., that can be gathered rather better from other books. No where else, however, can we learn that the "group of Basidiomycetes is divided into (1) Stomach fungi, (2) Spore sac fungi, and (3) Membrane fungi"; or that in Agarics the gills "contain the spores"; or that the trama "lies between the two layers of gills in Agarics."

In an outline of the system of classification, the principal genera are briefly characterized, and the meanings of their names are elucidated. The student may here learn much that no lexicon will ever reveal to him: that *Lactarius* = milk; *Marasmius* = to wither; *Cortinarius* = a veil; and *Telamonia* = lint. Having worked through the genera in this way, the authors proceed to give descriptions "of fungi familiar to most persons, classified according to the colors of the cap." The list begins with *Russula emetica*, described, as is not unusual, in such a way as to make it very doubtful whether the writers know the species. Thus, no mention is made of its viscidness, and it is said to grow "among dead leaves, in the woods and open places from July to December." *Cortinarius alboviolaceus*, the last species in the list, exemplifies a prevalent uncertainty in the handling of the Latin names. Then follows "a list of fungi that we constantly see, but which cannot be classified by the color of the cap." Here we find much curious information, as in regard to *Clavaria*

hava: "Stevenson does not mention this species, so it may be peculiar to this country." Of the Jew's Ear we learn a new habitat: "It is a very peculiar looking fungus, shaped somewhat like the human ear, of all sizes, and grows in great quantities in the same place."

But it is impossible, even by continuing to quote, to give the charm of this modest and kindly attempt to smooth the way to knowledge. Only the possession and leisurely perusal of the little volume will reveal its unique character.

The Mushroom Book. By Mina L. Marshall, New York, Doubleday, Page & Co., 1901, pp. 167, \$3.00.

Quite different must be the attitude of a reviewer to the latest book placed before the public. Written by a person with botanical training, "The Mushroom Book," lays claim, or should, to scientific accuracy and method. It is, to be sure, avowedly a popular book. The publishers would have wished to undertake no other kind. But even popular books can and should be scientific, in the true meaning of the word, that is to say, they should present facts accurately and systematically.

The book makes an admirable first impression, due to the amplitude of the pages and spacing, the broad margins, clear printing, sharply outlined cuts, and excellent plates. The publishers indeed, have done their work well. Examination of the book, unfortunately, effaces this good impression. The introductory matter, it is true, is on the whole well arranged and expressed, especially the chapter headed "From Spore to Mushroom." The Key which follows, too, is made intelligible to the novice by abundant diagrams illustrating the terms employed. It is with the bulk of the book, the hundred pages descriptive of genera and species, that fault must be found. Here there is absolute confusion. Groups, and genera under groups, are taken up, as it seems, haphazard. In the white-spored series of Agarics, for instance, the first five genera in order are Amanita, Cantharellus, Amanitopsis, Mycena, and Lentinus, and the last five are Schizophyllum, Omphalia, Russula, Clitocybe, and Tricholoma. Whatever may have determined this succession, it was not the probable convenience of the student, for no knowledge of any principle of classification will guide him when he wishes to refer to the description of a species and, if he has no such knowledge, he is not likely to be assisted as his familiarity with the order of the plates increases.

As to the character of the descriptions, it is very evident, even without the acknowledgment in the preface, that they do not imply any acquaintance on the part of the author with the plants themselves. And this criticism applies with special force to such species as *Russula emetica*, which demand the most accurate treatment. Nothing is said by Miss Marshall, any more than by the authors of "Among the Mushrooms," of the viscidness, characteristic of this plant. In fact no mention of this character is made under the genus, and yet it is of the utmost importance in distinguishing between species. The author's final remark that *Russula emetica* "may readily be distinguished by its peppery taste," betrays ignorance of the existence of other red species that are also acrid. She seems, indeed, to share the too common conviction, that any acrid red *Russula* is *R. emetica*. Her treatment of the yellow Amanitas is dangerous. The final recommendation in regard to them—that those with a cup are edible—is most unwise, for its application may not be restricted by careless people—those most exposed to danger.

Another instance of inaccuracy is in the statement in regard to the

genus *Hygrophorus*, that the gills are decurrent. Although this is true of many conspicuous species, so that an incorrect impression is easily gained by an unobservant person, it is by no means universally or even generally the case. Examination of some common species, *H. miniatus*, *H. puniceus*, *H. conicus*, and *H. chlorophanus*, for instance, will show an entirely different state of things. A few pages further on we are told under *Lepiota procera* that "there is no poisonous species for which it can be mistaken, if one bears in mind" its structural characteristics. Has the author never heard of *Lepiota Morgani*, a dangerous species, which a tyro would easily mistake for *L. procera*? Another source of dissatisfaction with the descriptions is their extreme scantiness in some cases. The characterization of some genera is so slight as to amount to nothing at all; examples are *Pholiota*, *Panaeolus* ("black, ovoid spores, cap smooth and not striate, a fleshy stem"), *Physalacria* ("small, simple, hollow, and enlarged at the apex"), *Lachnocladium* ("leathery plants covered with hairs") and *Trametes*.

The discovery of other inaccuracies and omissions of this kind must be left to the readers. One conspicuous tendency to misinform the uninstructed must however be mentioned. We all know the popular difficulty caused by Latin names. Recognizing this, the author, as her preface states, makes a point of marking the length of vowels and the place of accents. If her desire has been to record prevalent errors in the pronunciation of Latin, she has been remarkably successful. But she should have been surer of her ground before setting models that, if they have any effect, will tend to confirm some illiterate usages and establish others quite new. Whatever may be said of generic names, which often, as in the case of the American pronunciation of *Coprinus*, permanently escape from the control of the laws of quantity, there will never be but one correct way to spell and to accent specific names when they are formed by Latin adjectives. In spite of Miss Marshall, then, and those whose usage she records, it is incorrect to say *radicans*, *calopus*, *edulis*, *velutinus*, *procera*, *caesarea* and *albidum*, just as truly it is incorrect to write *velutipas* or *cretaceous*. This sort of thing becomes ludicrous when for *Favolus alveolaris* (the original spelling) is recommended *Favolus areolaris*.

The best thing about the book is the series of plates, around which the text is built. They are from the work of Mr. J. A. and Miss H. C. Anderson, whose colored photographs have been much admired. Only a few of these (*Armillaria mellea*, *Clavaria formosa*, *Boletinus pictus*, *Calostoma cinnabarinum*, for instance) fail to do justice to the plants. The rest are admirable. It is a noteworthy performance to have the three species of *Calostoma*, so long disputed, clearly differentiated on one plate. Yet the plates have been badly handled. They are not numbered, and some species are far removed from the places where they occur in the text.

It would be pleasant to find less to say in condemnation of a work like "The Mushroom Book." Its publishers are pushing it hard as the best book on the market. It is said to be selling well, and there is reason to fear that it is.

Attention may also be called to the following books, not previously mentioned in the Bulletins.

Memoir of the New York State Museum, No. 4, Vol. 3. Edible Fungi of New York, 1895-99. Albany, 1900. Charles H. Peck, State Botanist.

In this memoir are gathered descriptions and illustrations of certain species, included in Mr. Peck's reports 49, 51, and 52; others are added, making a total of 48 species described and figured—all edible but one. "This memoir" to quote from the introduction, "constitutes the second volume of descriptions and illustrations of New York species of edible and unwholesome mushrooms." The first volume was the well-known 48th report.

Mr. Peck's descriptions are, as usual in his writings for popular use, full and convincing. The illustrations, on the other hand, are unsatisfactory, and, like many others from the same source, suggest an endeavor to make the best of limited appropriations. It is hardly necessary to say, however, that this work, as well as Mr. Peck's annual reports, is indispensable to the student of American mushrooms. Mr. Peck speaks always with the authority of unequalled experience, for no other American author knows our toadstools as he does.

Of special interest are the figure and discussion of *Amanitopsis stragulata*; the treatment of *Hygrophorus fuliginus*, *H. flavodiscus* and *H. puniceus*, the last a species often mistaken for *H. coccineus*, and all three common in autumn in New England woods; and the discussion of six perplexing species of *Hypholoma*, of which *H. sublateritium* ("Brick-top") is the first.

The series ends with a fairly good figure of the unwholesome *Clitocybe illudens*, an interesting discussion of which, with an account of a case of poisoning by it, written by Dr. W. G. Farlow, may be found in *Rhodora* for March, 1899.

Führer für Pilzfreunde. E. Michael. Vol. ii. 1901. \$1.75

Owners of the first volume of Michael's guide will be pleased to learn of the appearance of a second. Its chief feature, as before, is the unrivaled excellence of its colored plates, which illustrate 107 species, as against 68 in volume one. Included are several Morels, also *Geoglossum*, *Leotia*, *Helvella*, *Peziza*, and three Truffles. As most all the species figured are found in America as well as in Europe, the book is quite as useful as if prepared expressly for American readers. Even people ignorant of German will find the plates useful, they are so true to nature. The convenient plan is followed of having the descriptions face the plates. No popular book deserves higher commendation than this, and nowhere else can such admirable plates be had for such a small price.

Funghi Mangerecci e Velenosi. G. Bresadola. Milan, 1899. \$7.00.

Here again we have a European work which may be made serviceable to American amateurs, to many of whom the botanical terms of the descriptions will be quite as intelligible in Italian as in English. The author is a trained student and speaks with authority. He treats of cosmopolitan species, and figures, in fairly good plates, 113 of them. Of especial interest is the treatment of certain species of *Clitocybe*, *Lactarius*, and *Russula*.

Members of the Club should remember that mushroom books can generally be procured to advantage through the Cambridge Botanical Supply Co., 1286 Massachusetts avenue, Cambridge, Mass. The Club herbarium may be consulted at the same place.

Boston Mycological Club.

Bulletin No. 19. (Issued Feb. 5, 1903.)

HOLLIS WEBSTER, Cor. Sec'y., P. O. Box 21, Cambridge, Mass.

The species of fungi represented by the following list were exhibited at Horticultural Hall, Boston, during the Summer and Fall of 1902. The exhibitions were held every Saturday from July 12th to November 1st inclusive. The material for the exhibitions was collected by members of the Club, in the vicinity of Boston mainly, though a few species were sent in from New Hampshire and others, notably, *Amanita Caesarea*, from the neighborhood of Worcester, Mass.

In comparing the present list with those kept in previous years the absence of several species formerly abundant was noted, and in general it may be said that the number and variety of specimens sent in for identification and exhibition was smaller than in other years, owing doubtless to the unfavorable season. It is hoped that this list will prove of use to the members of the Club, as indicating some of the species to be looked for in this vicinity.

JENNIE F. CONANT.

HYMENOMYCETES.

Agaricus arvensis Schaeff.
 campestris Linn.
 diminutivus Pk.
 flavescens R. & R.
 maritimus Pk.
 pusillus Pk.
 sylvicola Vitt.
 sylvicola Vitt. var.
 abruptus Pk.
Amanita Caesarea Scop.
 crenulata Pk.
 Frostiana Pk.
 muscaria Linn.
 phalloides Fr.
 rubescens Pers.
 rubescens Pers. yellow form.
 solitaria Bull.
 strobiliformis Vitt.
Amanitopsis strangulata (Fr.) Roz.
 vaginata (Bull.) Roz.
 volvata (Pk.) Sacc.
Armillaria mellea Fl. Dan.
 robusta A. & S.
Boletinus decipiens Pk.
 pictus Pk.

Boletinus porosus Pk.
Boletus affinis Pk. var. *maculosus*.
 albus Pk.
 alveolatus B. & C.
 Americanus Pk.
 auriporus Pk.
 bicolor Pk.
 brevipes Pk.
 castaneus Bull.
 chromapes Frost.
 chrysenteron Fr.
 cyanescens Bull.
 edulis Bull.
 elegans Schum.
 felleus Bull.
 flavus With.
 gracilis Pk.
 granulatus Linn.
 laricinus Berk.
 luridus Schaeff.
 miniato-olivaceus Frost.
 miniato-olivaceus Frost. var.
 sensibilis Pk.
 ornatipes Pk.
 pallidus Frost.
 piperatus Bull.
 punctipes Pk.

- Boletus Ravenelii* B. & C.
 regius Kromb.
 Russelli Frost.
 scaber Fr.
 separans Pk.
 subluteus Pk.
 subtomentosus Linn.
 versipellis Fr.
Cantharellus aurantiacus Fr.
 cibarius Fr.
 cinnabarinus Schw.
 floccosus Schw.
 infundibuliformis Fr.
 minor Pk.
 umbonatus Fr.
Claudopus nidulans (Pers.) Pk.
Clavaria aurea Schaeff.
 amethystina Bull.
 cinerea Bull.
 cristata Pers.
 formosa Pers.
 fusiformis Sow.
 inaequalis Fl. Dan.
 ligula Fr.
Clitocybe clavipes Pers.
 illudens Schw.
 infundibuliformis Schaeff.
 multiceps Pk.
 ochropurpurea Berk.
 odora Bull.
 trullisata Ellis.
Clitopilus abortivus B. & C.
 prunulus Scop.
Collybia butyracea Bull.
 distorta Fr.
 dryophila Bull.
 maculata A. & S.
 platyphylla Fr.
 radicata Rehl.
 tuberosa Bull.
 velutipes Curt.
Coprinus atramentarius Fr.
 comatus Fr.
 micaceus Fr.
 sylvaticus Pk.
 sterquilinus Fr.
Cortinarius albo-violaceus Fr.
 armillatus Fr.
 caerulescens Fr.
 cinnamomeus Fr.
 cinnamomeus Fr. var.
 semi-sanguineus Fr.
 corrugatus Pk.
 cyanites Fr.
 iodes B. & C.
Cortinarius mucifluus Fr.
 pholideus Fr.
Craterellus cornucopioides Pers.
 corrugis Pk.
 lutescens Fr.
Cyclomyces Greenii Berk.
Daedalea confragosa Pers.
 quercina Pers.
 unicolor Fr.
Entoloma clypeatum Linn.
 cuspidatum Pk.
Favolus Europaeus Fr.
Fistulina hepatica Fr.
Flammula alnicola Fr.
 var. *marginalis* Pk.
Galera lateritia Fr.
 tenera Schaeff.
Guepinia Spathularia Fr.
Hydnum adustum
 aurantiacum (Batsch) A. & S.
 caput-ursi Fr.
 coralloides Scop.
 imbricatum Linn.
 repandum Linn.
 albidum Pk.
Hygrophorus cantharellus Schw.
 caprinus Fr.
 chlorophanus Fr.
 conicus Fr.
 flavo-discus Frost.
 fuliginus Frost.
 laetus Fr.
 marginatus Pk.
 niveus Fr.
 pratensis Fr.
 psittacinus Fr.
 puniceus Fr.
 virginus Fr.
Hypholoma appendiculatum Bull.
 hydrophilum (Bull) Sacc.
 lachrymabundum Fr.
 perplexum Pk.
Inocybe calamistrata Fr.
Laccaria laccata Scop.
 laccata Scop. var. *amethystina*
Lactarius affinis Pk.
 chelidonium Pk.
 chrysorheus Fr.
 cinereus Pk.
 deceptivus Pk.
 exsuccus Smith.
 fuliginosus Fr.
 Gerardii Pk.
 glyciosmus Fr.
 helvus Fr.

Lactarius hygrophoroides B. & C.

lignyotus Fr.

luteolus Pk.

piperatus Fr.

subdulcis Fr.

trivialis Fr.

turpis Fr.

vellerius Fr.

volemus, Fr.

Lenzites betulina Fr.

saepiaria Fr.

Lentinus cochleatus Fr.

lepideus Fr.

tigrinus Fr.

Lepiota Americana Pk.

cepaestipes Sow.

cristata A. & S.

Friesii Lasch.

granulosa Batsch.

naucina Fr.

procera Scop.

rhacodes Vitt.

Marasmius oreades Fr.

rotula Fr.

velutipes B. & C.

Merulius lachrymans Fr.

tremellosus Schrad.

Mycena epipterygia Scop.

galericulata Scop.

polygramma Bull.

pura Pers.

Naucoria semi-orbicularis Bull.

Nolanea salmonea Pk.

Omphalia campanella Batsch.

campanella Batsch. var.

badipus Eng. Fl.

gracillima Weinm.

Panus conchatus Fr.

torulosus Fr.

stypticus Fr.

Panaeolus fimicola Fr.

retirugis Fr.

Paxillus atro-tomentosus Fr.

involutus Fr.

paradoxus Berk.=

Phylloporus rhodoxanthus

(Schw.).

Pholiota adiposa Fr.

aggericola Pk.

caperata Pers.

lutea Pk.

praecox Pers.

Pleurotus applicatus Batsch.

limpidus Fr.

Pleurotus ostreatus Jacq.

porrigens Pers.

sapidus Kalchb.

serotinus Schrad.

ulmarius Bull.

Pluteus cervinus Schaeff.

nanus Pers.

Polyporus (Polystictus) abietinus Fr.

adustus Fr.

betulinus Fr.

brumalis (Pers.) Fr.

(Fomes) carneus Nees.

cinnabarinus (Jacq.) Fr.

conchifer Schw.

elegans Fr.

frondosus Fr.

(Polystictus) hirsutus Fr.

(Fomes) igniarius Fr.

(Fomes) lucidus Fr.

Montagnei Fr.

ovinus Schaeff.

(Polystictus) perennis Fr.

Schweinitzii Fr.

sulphureus (Bull.) Fr.

(Polystictus) versicolor Fr.

Psathyrella disseminata Pers.

Russula adusta Fr.

cutefracta Cke.

decolorans Fr.

foetens Fr.

furcata Fr.

subfoetens Smith.

virescens Fr.

Schizophyllum commune Fr.

Stropharia semi-globata Batsch.

Strobilomyces strobilaceus Berk.

Thelephora Schweinitzii Pk.

Trametes suaveolens L.

Tremella frondosa Fr.

lutescens Pers.

Tremellodon gelatinosum Pers.

Tricholoma album Schaeff.

columbetta Fr.

equestre Linn.

imbricatum Fr.

melaleucum Pers.

personatum Fr.

portentosum Fr.

Russula Shaeff.

rutilans Schaeff.

sordidum Fr.

terreum Schaeff.

virgatum Fr.

Trogia crispa Fr.

GASTROMYCETES.

Calostoma cinnabarinum Desv.
Cyathus striatus Hoffm.
Crucibulum vulgare Tul.
Dictyophora duplicata (Bosc). Ed.
Fischer.
Geaster hygrometricus Pers.
Morganii Lloyd.
Lycoperdon Wrightii B. & C. var. *Sep-*
arans Pk. = *L. cruciatum* Rostk.
cyathiforme Bosc.
gemmatum Batsch.
gemmatum Batsch. var.
hirtum.
giganteum Batsch.
pyriforme Schaeff.
Mutinus caninus Fr.
Phallo-gaster saccatus Morgan.
Scleroderma verrucosum Pers.
vulgare Fr.
bovista Fr.

ASCOMYCETES.

Bulgaria rufa Schw.

Cordyceps militaris (L.) Lk.
Daldinia concentrica (Bolt.) Ces. &
De Not.
Geoglossum hirsutum Pers.
Peckianum Cke.
Helvella crispa (Scop.) Fr.
infula Schaeff.
lacunosa Afzel.
Hypomyces inaequalis Pk.
on *Amanita*.
lactifluorum (Schw.) Tul.
on *Lactarius*.
viridis (A. & S.) Sacc.
on *Russula*.
Leotia chlorocephala Schw.
lubrica Pers.
Mitrule rufa (Schw.) Masee.
Peziza aurantia Pers.
badia Pers.
flava Klotzsch.
macropus Pers.
vesiculosa Bull.
Rhizina inflata Quelet.
Xylaria polymorpha.

The appended list is taken from an article published in the American Kitchen Magazine giving an account of the edible fungi collected and eaten by members of the Boston Mycological Club mainly during 1896, and is added for the sake of bringing together the two published lists.

Species already included in the list given above are not repeated. Species of doubtful identification have been omitted.

Clavaria botrytes Pers.
rugosa Bull.
pistillaris L.
Clitocybe dealbatus Sow.
Clitopilus unitinctus Pk.
Seymourianus Pk.
Cortinarius collinitus Fr.
sebaceus Fr.
violaceus Fr.
Hygrophorus hypothejus Fr.
Hypholoma candolleianum Fr.
Lactarius deliciosus Fr.
Marasmius alliaceus Fr.

Marasmius scorodoni Fr.
Morchella esculenta Bull.
Pholiota verna.
Russula alutacea Fr.
aurata Fr.
heterophylla Fr.
ochracea Fr.
punctata Gt.
Sparassis crispa Fr.
Stropharia stercorearia Fr.
Tricholoma coryphaeum Fr.
nudum Bull.
tumulosum Kalchbr.

Boston Mycological Club.

Bulletin No. 20. (Issued June, 1903).

HOLLIS WEBSTER, Cor. Sec'y., P. O. Box 21, Cambridge, Mass.

CLITOCYBE TRULLISATA, Ellis.

W. G. FARLOW

CLITOCYBE TRULLISATA, Ellis.

Among the mushrooms characteristic of the sandy soil of Massachusetts, and well known especially in the eastern part of the state where collectors are numerous and active is the species of *Clitocybe*, *C. trullisata*, which is illustrated on the opposite page. In October and November one has only to pay a visit to almost any "old sandy field" to find this plant in good fruit; and if a trip be taken to the sands about Plymouth and on Cape Cod, to the dunes of Ipswich, or to the sandy plains farther inland, as near Lowell for instance, it will be found in abundance, showing its dull brown cap in the barrenest spots, without a green or growing thing about it, where one would really not expect to find any fungus of the sort. As it grows it usually looks dwarfed, as if it had n't much of a stem. But this appearance is deceptive. There is a stem, long and surprisingly stout and swollen, but it is out of sight, deeply buried in the sand, which sticks to it as closely as to the root hairs of a seedling, when you pull it up. This stem which is a characteristic mark of the mushroom is of a beautiful metallic violet color, when the sand is rubbed off. The same color appears in it when it is broken, but is brilliant only when the plant is fresh, and the color is nearly or quite lost in drying. A dark violaceous tint appears also in the broad, rather distant gills, but this soon gives place to brown, without any assistance from the spores, which, it must be remembered, are white. The gills are extremely brittle. Brittleness, indeed, is a peculiar quality of the plant, increasing as it wilts and dries. Specimens received by mail frequently are reduced on arrival to a mass of fragments, easily identified. The resemblance of this *Clitocybe* to large overgrown forms of the common *Clitocybe laccata* (*Laccaria laccata*) is very striking and not infrequently stout specimens of the latter, especially if they show violaceous tints, are easily mistaken for it.

The following is the description of the fungus as given in the Torrey Bulletin in Nov., 1874, by Mr. Ellis, who found it in New Jersey.

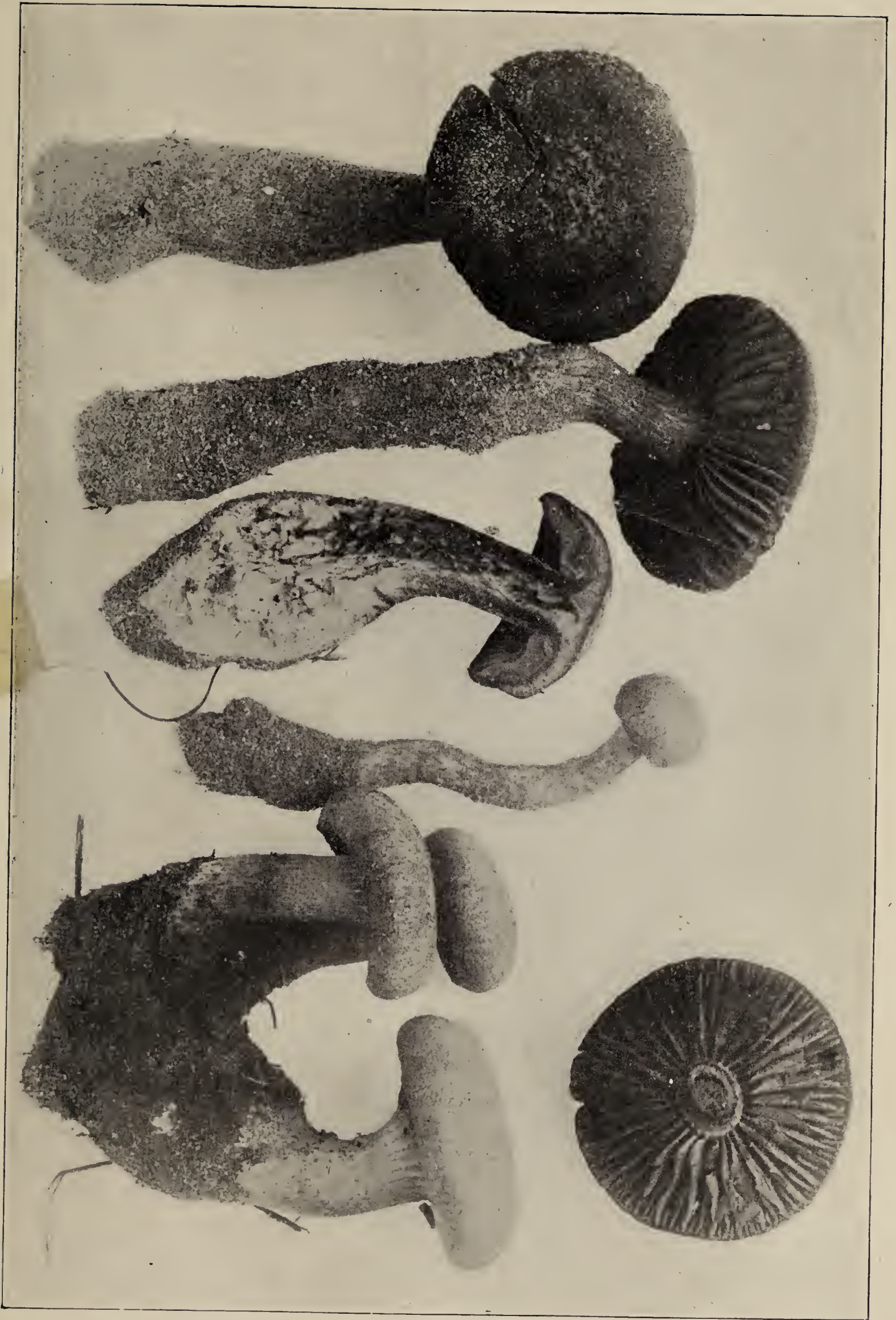
Pileus carnose [i. e. fleshy], plano-convex, at length depressed in the centre, innate-fibrose-squamose, becoming smoother in the disk, margin thin; gills unequal, not crowded, coarse and thick, adnate with a decurrent tooth, at length white pulverulent, purple-violet at first, becoming dark brick-red; stem stuffed, fibrillose, with a long clubshaped base, penetrating deeply into the sand; spores large, cylindric-oblong, .0006 to .0008' long.

In old sandy fields, Sept.-Oct.

The interior of the stem in the young plant is, like the gills, violet-purple, and the club shaped base is covered with a tomentose coat, to which the sand adheres tenaciously. Related to *Clitocybe laccata* Berkeley, and to *Clitocybe ochro-purpurea* Berkeley.

Autumn is the season for this mushroom. It has been exhibited by the Club as early as Sept. 28th and as late as Nov. 11th. It can be found showing its head even after the first hard frosts.

It is an excellent mushroom to eat, but it should be gathered with care so as to keep it free from sand. It is best, therefore, to cut the heads off as they stand, and leave the stems behind. Its good qualities were first called to attention by Mr. Julius A. Palmer, who used to eat of it whenever he could, and often served a dish to his friends.



Boston Mycological Club.

Bulletin No. 21. (Issued January, 1904.)

HOLLIS WEBSTER, Cor. Sec'y, P. O. Box 21, Cambridge, Mass.

AGARICUS SUBRUFESCENS, Peck.

W. G. FARLOW

AGARICUS SUBRUFESCENS, Peck.

The species of *Agaricus* illustrated on the opposite page has interested amateurs of mushrooms in the neighborhood of Boston in the last few years by its distinct and striking characteristics and its vigorous behavior. Its spontaneous appearance in various greenhouses in widely separate localities has brought it to notice at various times because it forced itself so persistently and abundantly on the owners that they have sent in specimens to the Club exhibitions in order to learn whether the visitation was to be regarded as a curse or as a blessing. Happily it has been possible to tell them that *Agaricus subrufescens* was to be looked upon as a valuable mushroom, easy to grow and to sell. Some of its "hosts" have marketed it to their profit, some even planting it out with good results.

During the months of August and September it has been reported from several places about Boston growing out of doors on compost heaps of dried leaves, but never, so far as is known, has it been found in a strictly wild state. When it appears it comes with a rush, having previously, with its strong growing, strand like mycelium, taken possession of some rich portion of soil, and then sends its abundant fruits to the light, undaunted by any overlying difficulties.

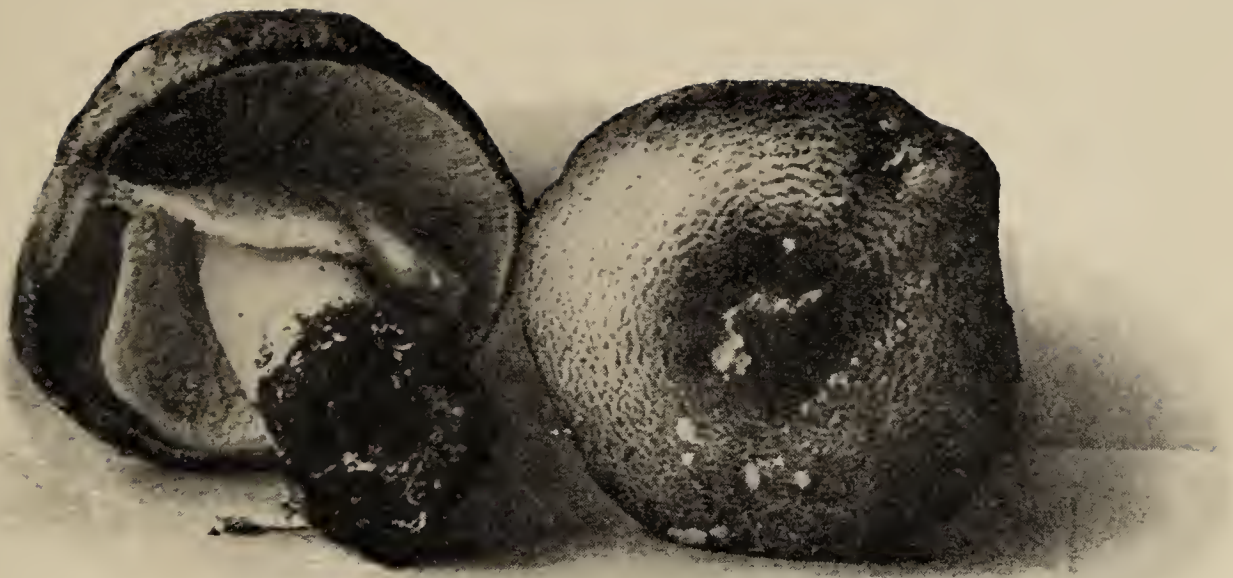
It may be recognized by the following description of Prof. Peck (Report 46, p. 25) "Pileus, rather thin and fragile, at first deeply hemispherical, then convex or broadly expanded, often wavy or irregular, silky fibrillose or minutely and obscurely squamulose, varying in color from whitish or grayish to dull reddish-brown, flesh white, unchangeable; lamellae close, free, at first white or yellowish-white, then pinkish, finally blackish-brown; stem minutely flocculose below the annulus, hollow, white, somewhat thickened or bulbous at the base; the annulus membranous, white, externally flocculose; the mycelium white, forming slender branching rootlike strings; spores elliptical, brown, .00024 to .00028 in. long, .00015 to .0002 broad.

Pileus 2 to 4 in. broad; stem 2 to 6 in. long, 4 to 8 lines thick.

Leaf mold. Glen Cove. October. W. Falconer. Also cultivated.

In the form of the young pileus and in its color in the reddish tinted specimens, also in the white color of the young lamellae, this species makes an approach to *A. campestris* var. *rufescens*, but unlike that variety the wounded flesh does not become red. From typical *A. campestris* it differs in many respects—in the thin flesh, the color of the young lamellae, the character of the stem and its annulus and in its mycelium. It resembles more closely *A. placomyces* and *A. sylvaticus*, but from the former it may be separated by the shape of the pileus and the more obscure character of its scales and by its annulus, from the latter, by the color of the pileus and the young lamellae and also by the annulus, which is externally floccose-squamulose and also not distant as in that species."

It will be noted that its marked characteristics are the deeply hemispherical shape of the cap, the whitish color of the young gills, the hollow nature of the stem, the flocculent lower surface of the veil, the strong almond odor and taste. (See 48th Report of the New York State Museum, pp. 138 to 140.)



$\frac{1}{2}$ natural size.



$\frac{1}{2}$ natural size.

